U. S. NAVY Medicine

January 1971

United States Navy Medicine

Vol. 57 January 1971 No. 1

POLICY

U.S. Navy Medicine is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry and allied sciences. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article, in its original form. The opinions and conclusions expressed in the articles or items included herein are those of the respective authors and do not necessarily represent the views of the Department of the Navy, the Bureau of Medicine and Surgery or any other governmental department or agency thereof.

DISTRIBUTION

U.S. Navy Medicine is distributed to active duty Medical Department officers via the Standard Navy Distribution List (SNDL) vice personal addresses. Any increase or decrease in the number of allotted copies should be requested via the local Commanding Officer through U.S. Naval Publications and Forms Center, Code 306, 5801 Tabor Avenue, Philadelphia, Pa. 19120. Other addressees may forward changes of address in the same manner, giving full name, rank, corps, old and new address, and zip code. The mailing label taken from the most recent issue should be forwarded if possible. See inside back cover for CORRESPONDENCE AND CONTRIBUTIONS.

The issuance of this publication approved in accordance with NAVEXOS P-35.

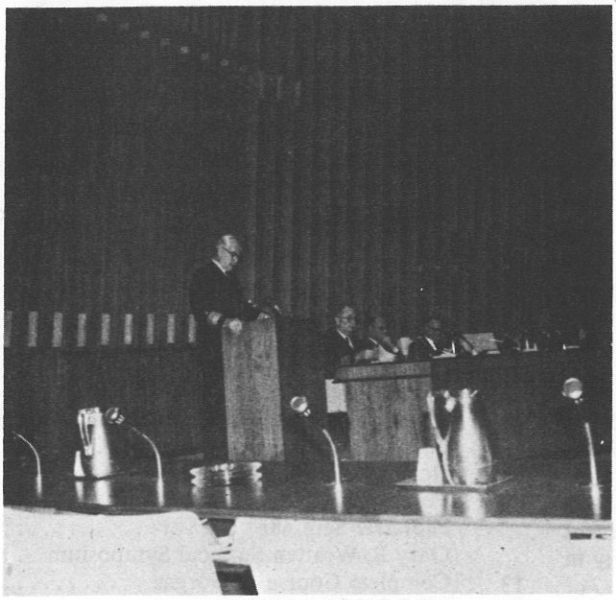
NAVMED P-5088

CONTENTS

Credits: All pictures are Official U.S. Navy Photographs unless otherwise indicated.

Front Cover photograph by LTJG George Gillett reveals a young victim of Typhoon Joan receiving immunization for cholera and typhoid fever. The Navy corpsman, from the Seventh Fleet amphibious assault ship USS Okinawa, was a member of the medical team which responded to the call for assistance in the Philippines. (See feature article "Typhoon Joan".)

Back Cover photograph reveals VADM George M. Davis, MC, USN, Surgeon General, addressing the Sixth Conference of the Surgeons General of the Navies of the Americas. We are indebted to the Photography Division of the Medical Graphic Arts Department of the Naval Medical School, NNMC, Bethesda, Md., for the fine photographic support which was rendered throughout the conference. Pictures were taken by HM1 Donald R. Poorman, USN. (See "Highlights of the Sixth Conference of the Surgeons General of the Navies of the Americas".)



from the Chief

For several months we in BUMED and the Navy Department have stressed repeatedly the values of personalized, courteous service, be it medical, supply, disbursing or what have you. Examples have been cited, situations described and sensitivity encounters have been held. It is believed that much progress has been and is continuing to be made.

While we have mentioned in each of our talks or letters the infrequent, abusive, demanding or unreasonable patient, we perhaps have not emphasized sufficiently to our younger physicians our firm conviction that courtesy and personal appreciation is a two-way street. It is our goal and objective to provide the best quality health care for our eligible patients in a courteous and dignified manner. We feel equally responsible for ensuring that our physicians, working often in crowded and harassing circumstances, are not maligned, embarrassed or subjected to unreasonable demands. It is well recognized that sick people can at times be anxious, tense and irritable. We are prepared to accept this and provide the proper support at such times. However, inconsid-

erate or inappropriate conduct need not and should not be tolerated. A small number of worried, well or slightly sick individuals can on occasion be obnoxious and disruptive. In such rare instances, administrative or command support should be promptly sought and provided.

Every member of the health care team is expected to be polite, responsive and helpful; however, it is also expected that he or she providing the care shall be treated in an equally reasonable manner. In this way we all become more appreciative of each other and more able to work together on our great Navy team. Criticism is both an instrument for good and evil. If properly evaluated and utilized it can be a boon. If unjustified and not corrected, it can be destructive.

It has been most gratifying to me recently to receive an increasing number of compliments concerning the care being rendered in our medical and dental facilities. My compliments to you, one and all!

"It is not the critic who counts, not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. The credit belongs to the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; who knows the great enthusiasms, the great devotions, and spends himself in a worthy cause; who, at the best, knows in the end the triumph of high achievement; and who, at the worst, if he fails, at least fails while daring greatly, so that his place shall never be with those cold and timid souls who know neither victory nor defeat."

Theodore Roosevelt

(Courtesy of Army Information School.)

DELAYED ARTERIAL SPASM AND THROMBOSIS AS A CAUSE OF POST-TRAUMATIC HEMIPLEGIA (SPATE THROMBOSIS)

By CAPT Frederick E. Jackson, MC, USN, and LCDR James B. Back, MC, USNR,†. Reprinted from STROKE—A Journal of Cerebral Circulation 1(4): 278–285, July-August 1970.*

Introduction

When a patient, who has been satisfactorily recovering from a head injury, then has a dilated pupil and a hemiparesis, the neurosurgeon has been trained to think of several possible intracranial complications: If the patient has had operative evacuation of an epidural, subdural or intracerebral hematoma, the postoperative development or redevelopment of a hemiparesis alerts the clinician to the possibility of recurrent hematoma formation. If the patient has not had operative removal of an intracranial hematoma, and several days after injury a hemiparesis subsequently develops, then the neurosurgeon's thinking is oriented to the formation of a delayed subdural or epidural hematoma, or cerebral embolism, or of the remote possiblity of "spate apoplexy," i.e., hemorrhage into a softened area of encephalomalacia in the brain. There is, however, *another* cause of delayed hemiparesis following head injury, namely the development of delayed thrombosis of a major intracranial vessel following trauma.

It is the purpose of this article to call attention to this unusual complication of brain injury, to review prior case reports and to present carotid angiograms that document sequential spasm and thrombosis of intracranial vessels, a sequence of angiograms not presented in prior cases.

Case Report

A retired 37-year-old staff sergeant, U.S. Marine Corps, was admitted to the neurosurgery service of the Naval Hospital, Camp Pendleton, California, on November 12, 1968, after having been attacked by unknown assailants and hit in the head by a blackjack four days previously. The patient stated that he had been struck from behind by a blackjack in an alley after leaving a bar. He had been rendered unconscious and was taken to a civilian hospital where he was observed overnight. A scalp laceration above and behind the left ear was debrided and sutured. He was discharged from the local hospital the next day, but over the next two days an excruciating headache developed and he was brought to the Naval Hospital in Camp Pendleton. He had had a large alcohol intake for many years. Positive findings on physical examination revealed a well-developed, somnolent male complaining bitterly of severe headache. There was blurring of the optic disks bilaterally in their temporal margins. There were a left hemotympanum and a sutured laceration of the left temporoparietal scalp, with tenderness over the left mastoid area and ecchymosis and tenderness over the parietal areas bilaterally at the vertex of the skull. The patient was able to move all of his extremities; there were no sensory deficits. Extraocular motility was normal. Deep tendon reflexes were symmetrical; Hoffman's signs were bilaterally present, but Babinski signs were not present. There was a peripheral left facial weakness as a result of the left temporal contusion. Laboratory examinations were normal. Skull X-rays revealed a bilateral fracture of the parietal bone at the vertex (fig. 1, not shown). This fracture extended from the left to the right parietal bone crossing the superior sagittal sinus. There was no depression of the fracture. Lumbar puncture revealed grossly bloody spinal fluid with a pressure of 230. Carotid angiography revealed a slow intracranial vascular circulation rate. The anterior cerebral artery was shifted 3 mm from left to right. Other than the slight shift of the anterior cerebral artery, the arterial portion of the angiogram (figs. 2 and 3) was normal

---

The opinions or assertions contained in this paper are those of the authors and are not to be construed as official or reflecting the views of the Navy Department or the Naval Service at large.

* Chief, Department of Neurological Surgery, Naval Hospital, Camp Pendleton, California.

† Formerly Department of Neurological Surgery, Naval Hospital, Camp Pendleton, California; current address: University Hospital, University of Kentucky, Lexington, Kentucky 40506.

This study was supported in part by Bureau of Medicine and Surgery, Navy Department, Research Grant M4305.05-0003A.

Reprints obtainable from CAPT Frederick E. Jackson, MC, USN, Chief, Department of Neurological Surgery, Naval Hospital, Camp Pendleton, California 92055.

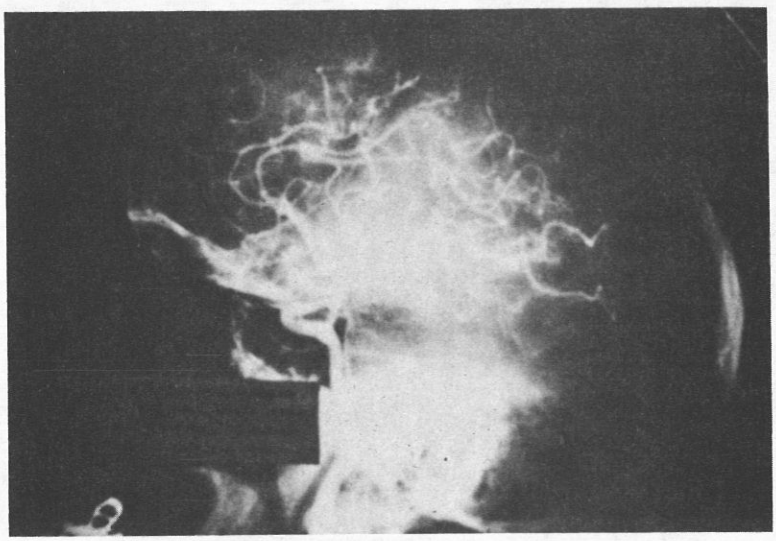


FIGURE 2

Left carotid angiogram, arterial phase: All major arteries fill out well; there is no evidence of spasm or thrombosis.

without evidence of spasm or thrombosis. The late venous phase of the initial carotid angiogram (fig. 4) revealed a 6 mm depression of the superior sagittal sinus underlying the parietal fracture, indicative of an epidural hematoma depressing the superior sagittal sinus.

On the day of admission the patient was taken to surgery, where bilateral parietal bone flaps were turned utilizing a pneumatic craniotome. A 100 cc epidural hematoma depressing the dura and superior sagittal sinus was evacuated. In addition, on the left side there was a 200 cc subdural hygroma which was removed. Following surgery the patient immediately became more alert and his headaches rapidly subsided. He did extremely well, being both alert and ambulatory for two days, but then a right hemiparesis and dilated left pupil developed. A repeat carotid angiogram at that time revealed again a very slow intracranial circulation rate. There was now an area of avascularity in the left posterior parietal area with nonfilling of the posterior parietal branch of the left middle cerebral artery (fig. 5). In addition, there was marked spasm of the left internal carotid artery just prior to its bifurcation. There was also spasm of the proximal anterior cerebral artery and also of the proximal left middle cerebral artery (fig. 6, not shown). The entire area of distribution of the posterior parietal branch of the left middle cerebral artery was not opacified.

To rule out the possibility of a recurrent hygroma

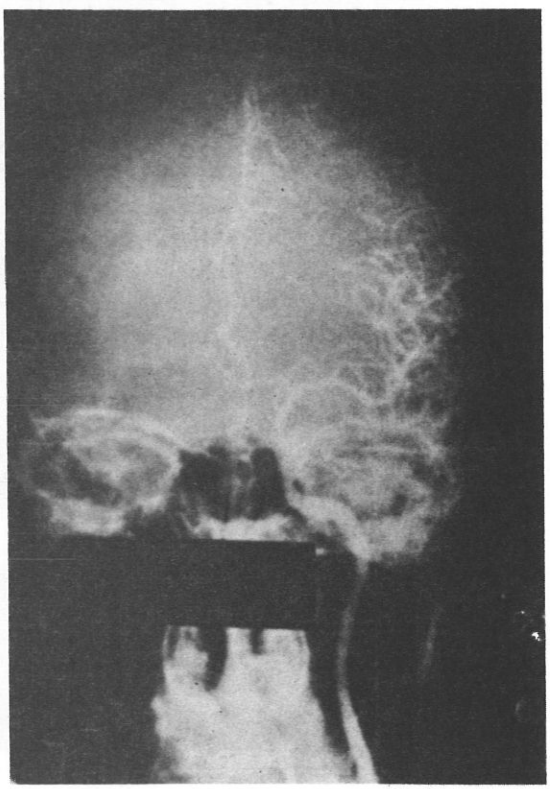


FIGURE 3

Left carotid angiogram, arterial phase, AP view showing shift of the anterior cerebral artery from left to right of 3 mm. All major arterial vessels fill well.

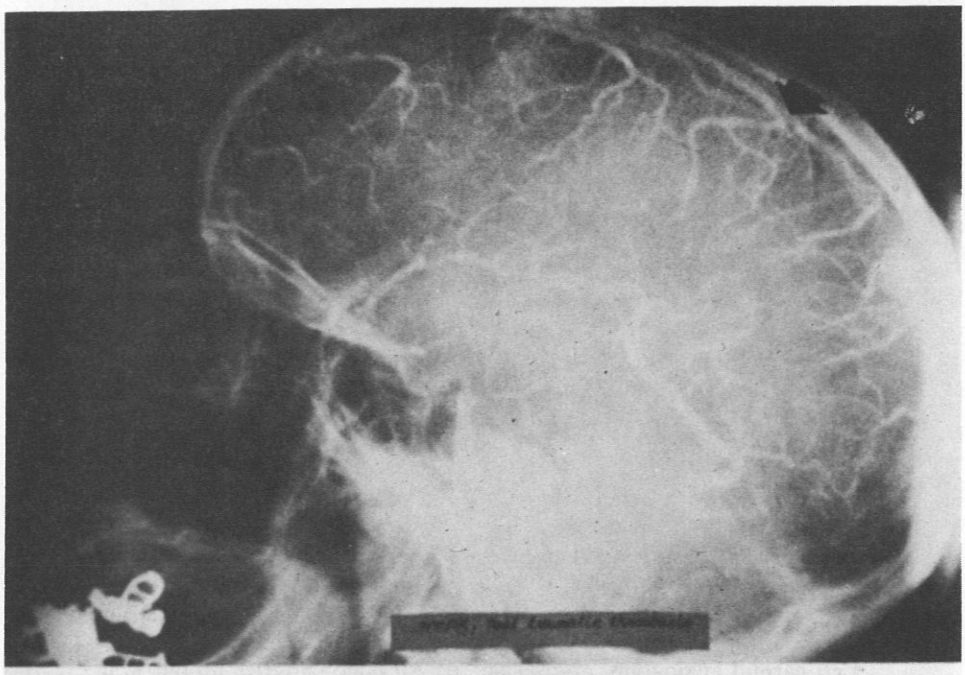


FIGURE 4

Late venous phase of initial left carotid angiogram showing 6 mm depression of the superior sagittal sinus underlying the fracture of the vertex of the skull. The depression of the superior sagittal sinus is caused by epidural hematoma.

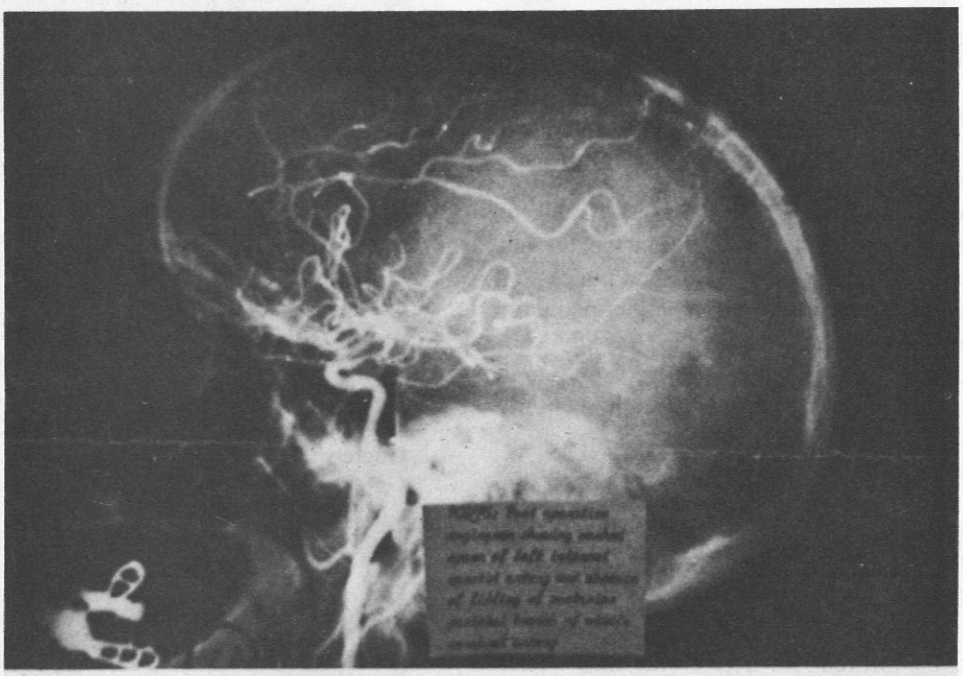


FIGURE 5

Postoperative left carotid angiogram, arterial phase: This angiogram, taken two days after evacuation of epidural hematoma of vertex, was performed because of the delayed development of right hemiparesis. The burr holes and osteoplastic flap in the vertex representing the site of removal of the epidural hematoma are seen. Notice the avascularity in the distribution of the posterior parietal branch of the left middle cerebral artery. Also, note the area of spasm in left internal carotid artery.

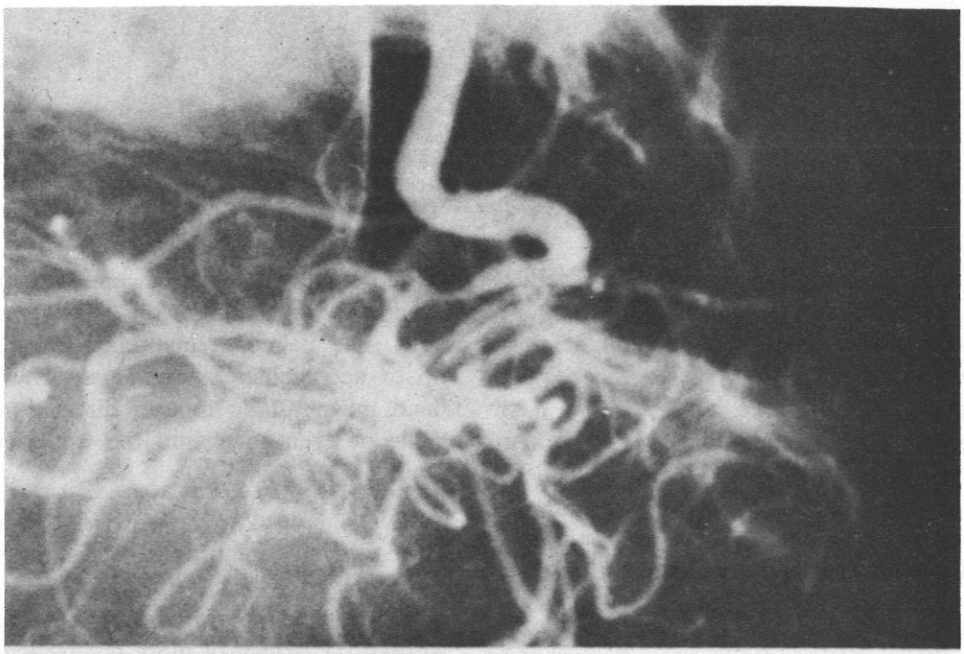


FIGURE 10

Enlarged view of arterial phase of left carotid angiogram, lateral view, showing spasm in left internal carotid artery.

or hematoma in the area, a left osteoplastic craniotomy was performed. There was no evidence of epidural or subdural hematoma. A venous sinogram of the superior sagittal sinus (fig. 7, not shown) was performed at the operating table which revealed patency of the superior sagittal sinus under the parietal fracture site. In the absence of hematoma and with angiographical evidence of marked post-traumatic spasm of the left internal cerebral, left middle cerebral and to a lesser extent the left anterior cerebral arteries, the patient was treated with vasodilators (carbogen [7% CO_2]). His blood pressure was kept to normal levels to insure adequate cerebral arterial perfusion, but clinical evidence of progressive cerebral infarction continued. He died on November 21, 1968, 13 days after the cerebral trauma and 11 days after signs of progressive post-traumatic cerebral arterial spasm with infarction of the left parietal lobe had developed.

Autopsy findings revealed that the scalp wounds were healing well. The superior sagittal sinus was patent throughout its course. The left parietal lobe of the brain in the distribution of the posterior parietal branch of the middle cerebral artery revealed encephalomalacia as a result of infarction. Detailed examination of the left internal carotid artery revealed the vessel to be anatomically normal. There were no arteriosclerotic changes in the vessel at the level of antemortem thrombosis. A recent thrombus was present in the posterior parietal branch of the left middle cerebral artery.

Discussion

We are indebted to the British neurosurgeons, Sir Hugh Cairns and Mr. Walpole Lewin, for calling attention to delayed thrombosis of a major intracranial artery following blunt head injury. In Cairns' review of vascular aspects of head injury in 1942 he was able to find only one prior case, that of a 23-year-old male who fell from his bike; the next day right hemiplegia and aphasia developed. A left osteoplastic skull flap revealed, as in our case, no extradural or subdural hematoma, and the patient died three days after the accident. Autopsy revealed the left Sylvian artery (the middle cerebral artery) to be obstructed by a dark, firm, slightly adherent blood clot which extended retrograde into and almost completely blocked the intracranial portion of the left internal carotid artery. At that time Cairns reported a case (case 2) of a 27-year-old male who was thrown from his motorcycle; a right hemiplegia developed nine days after the accident. Arteriography revealed obstruction of the left internal carotid artery intracranially at its bifurcation. The motorcyclist died nine months after his injury following a prolonged course characterized by coma and right hemiparesis. At autopsy the most distal portion of the left

(*Continued on page 19*)

OPHTHALMIC INJURIES*

Fragment wounds involving the globe, the eyelids, or the orbit are frequently seen. A large percentage of these wounds are associated with maxillofacial or neurosurgical wounds, and many cases will require the care of specialists in all three fields.

It is preferable for the ophthalmologist to be one of the first to perform surgery if a penetrated globe is felt to be reparable. Inadvertent pressure on the injured globe or dependent positioning on the operating table can result in prolapse of intraocular contents and the ultimate loss of the eye. Repair of a globe should be preceded only by surgery to correct a life-threatening situation.

1. Intraocular Foreign Bodies

If a penetration of the globe is present, and X-rays reveal a probable intraocular foreign body, a prompt attempt to remove the foreign body with the magnet is usually indicated. Precise radiographic localization is not possible in most hospitals in Vietnam, but an estimate of the location within the globe should be made by studying the A-P, lateral and Waters' views.

In most cases, an attempt should be made to remove the foreign body through the wound of entry. If a giant magnet is available, removal can be accomplished after the induction of anesthesia but before sterile preparation of the patient, care being exercised not to contact the globe with the unsterile magnet tip. Nonmagnetic sterile forceps are used to orient the eye in the desired position, and a nonmagnetic speculum must be used. The eye must be oriented so that the wound of entry and the estimated position of the foreign body are in line with the main line of magnetic force before the magnet is activated.

In many cases, the preliminary unsterile attempt at removal will be unsuccessful, in spite of the fact that movement of intraocular structures has indicated that the foreign body is magnetic. Sometimes the foreign body is trapped at the wound of entry by conjunctiva or prolapsed uveal tissue. In such a case, the patient should be properly prepared for sterile surgery, the wound should be exposed, and prolapsed tissue excised to free the way for the extraction of the foreign body. The magnet is then reintroduced, with a sterile tip to accomplish the removal. The less powerful hand magnet may require direct contact with the globe or even entry into the wound to accomplish removal.

If it is judged to be unwise to attempt removal through the wound of entry, an incision can be made through the pars plana for extraction. It is probably best, however, not to perform this type of surgery without the benefit of more precise localization techniques, and attempts at extraction should probably be delayed until after medical evacuation, where such techniques are available.

No attempt should be made to extract a nonmagnetic foreign body.

Efforts to extract foreign bodies which are intraorbital but extraocular are usually ill-advised. If a foreign body is very large and located in the anterior orbit, removal may be attempted, but attempts to remove foreign bodies from the posterior orbit are very hazardous, and usually the damage caused by the surgery exceeds the damage caused by the retention of the foreign body.

2. Corneal Lacerations

Perforating wounds of the cornea are common. Often repair is difficult because of the stellate shape of the laceration. Prolapsed iris should be excised and the wound completely cleared of iris tissue. Repair should then be made with 7–0 or 8–0 silk. The use of fine-toothed forceps (Colibri type or Bonn) is essential for an accurate closure.

Air should be injected into the anterior chamber at the conclusion of the repair, both to test the tightness of the closure and to assure that anterior synechiae will not form. It is often very difficult to inject air through the laceration itself. A counter-puncture with a knife-needle (Swan or Ziegler) is often necessary, and in many cases will facilitate the retention of an air bubble which could not be achieved by injecting through the laceration. In some cases, where the wound is old and the cornea very soft or where there

* Taken from proceedings of CINCPAC Fourth Conference on War Surgery, February 1970.

is a very jagged, stellate laceration, it is impossible to achieve an airtight closure. Fortunately, most of these cases will spontaneously form an anterior chamber during the first several postoperative days.

3. Scleral Lacerations

The apparent size of a scleral laceration is often deceptive and thorough exposure often reveals the laceration to be huge and irreparable. If the intraocular contents are not prolapsed, however, repair of even large lacerations should be attempted. Prolapsed uveal tissue and vitreous should be excised. 6–0 chromic catgut has proved to be an excellent suture for repair. The conjunctiva is then closed with the same material.

Many eyes with scleral lacerations and vitreous hemorrhage are found to have no light perception on initial examination, despite the fact that the damage does not appear to be devastating. The frequency with which this occurs is very discouraging, but surprisingly, a significant percentage of these eyes will regain light perception and even some formed vision. Certainly repair should be attempted if possible, in spite of initial lack of light perception.

A reliable sign of a relatively posteriorly located scleral laceration or rupture is recession of the iris and gross deepening of the anterior chamber. Such eyes should usually be explored, although many of the lacerations will be located too far posterior to be repaired.

4. Infections

The incidence of endophthalmitis has been high in Vietnam, and the usual offending organisms are gram-negative rods. Penetrating injuries from mines, which give a "mudblast" effect are extremely likely to become infected, despite prophylactic antibiotics.

Prophylactic antibiotics are indicated in every penetrating injury of the globe, and an antibiotic must be chosen which will penetrate the noninflamed eye. In Vietnam, it is essential to choose an antibiotic with a wide gram-negative spectrum, and it is also advisable to choose an anti-Pseudomonas agent. Many antibiotics are effective and safe when given by the subconjunctival route. Chloramphenicol (50 mg.) and colistin (20 mg.) provide a wide spectrum of coverage. These two may be combined with penicillin G (500,000 units) or ampicillin (50 mg.) for more complete gram-positive range. The best choices systemically are chloramphenicol (500 mg. q6h p.o. or IV push), ampicillin (500-1000 mg. q6h p.o., IM, or IV, or cephaloridine (1 g. q6h IM or IV).

The treatment of endophthalmitis is subject to many variations. The *Handbook of Ocular Therapeutics and Pharmacology* by Ellis and Smith is particularly helpful. One acceptable regimen for initial therapy consists of IV chloramphenicol and ampicillin, intensive topical application of neosporin with added polymyxin B, and daily subconjunctival injections of chloramphenicol, and colistin. In general, however, the therapeutic results of any regimen are very disappointing.

5. Eyelid Lacerations

Even with extensive, irregular lacerations, accurate anatomic closure is usually possible. Every effort should be directed toward achieving a precise approximation in order to avoid the need for subsequent plastic revisions. If there has been avulsion of large portions of the lids, accurate closure, is of course, impossible, but an attempt must be made to achieve as complete a closure as possible. If the lid margin is absent, skin should be closed to conjunctiva.

Débridement should be minimal. All foreign material should be carefully removed, but very little skin should be removed. Even skin which appears to be nonviable should be preserved in most cases; such tissue has survived in a high percentage of cases. In general, the use of rotation or sliding flaps is contraindicated as a primary procedure because infection then endangers this otherwise normal tissue. Early split thickness grafts taken from a remote site are preferable; flaps may be mobilized at a later date.

Closure of lid lacerations should be made in two layers, 4–0 catgut is recommended for the conjunctiva-tarsal plate layer, and if interrupted sutures are used, inversion of the stitch is recommended for the skin. Larger lacerations, not involving the lid margins may be closed with 5–0 nylon, which produces less tissue reaction. Nylon sutures, however, are much more prone to scratch the cornea and should not be used near the globe.

Soft tissue infections are not uncommon, and are particularly likely following "mud blast" injuries. The infected wounds should be covered with wet fine-mesh gauze, covered by dry gauze and Kerlix wrap. These dressings should be changed three or four times daily. The frequent changing of the wet gauze provides effective continuous débridement. Usually, early suture removal is necessary to allow adequate drainage. Hydrogen peroxide cleansing is also helpful. Antibiotics must be started immediately.

6. Enucleation and Evisceration

The choice between these two operations is largely dictated by the surgeon's own preference, although many globes are too shattered to be amenable to evisceration.

The ideal enucleation procedure involves the isolation of the rectus muscles and the attachment of the muscles to some type of implant. This, however, is a time-consuming procedure, and the long-term advantages are not striking. Time often dictates against choosing this longer procedure in a war zone, and the results from simple insertion of a plastic sphere have been satisfactory. Some additional mobility and security for the implant can possibly be gained by simply joining the four rectus muscles anterior to the sphere without actually attaching them to the implant.

It is desirable to replace as much volume as possible in most cases, and an 18 mm. implant can usually be used. There has been some difficulty with extrusion of these larger implants, however, and if there is any doubt, a 15 mm. implant should be chosen. The insertion and maintenance of a lid conformer is important, although destruction of lid tissue and conjunctiva sometimes makes the insertion of a conformer impossible.

If evisceration is performed and the cornea is left in place, it is important not to choose too large an implant. Pressure necrosis of the cornea can result.

7. Orbital Fractures

Blowout fractures of the orbital floor often present first to the ophthalmologist. Initial periorbital swelling often makes the diagnosis difficult, but surgery may safely be postponed up to 10 days after injury, and in fact it is usually desirable to postpone surgery until the acute swelling has at least partially subsided.

Waters' views often are helpful in making the diagnosis, but a negative X-ray does not rule out the presence of a significant fracture. It is very uncommon for a floor fracture to exist in the absence of infraorbital hypesthesia, although the presence of hypesthesia is certainly not diagnostic of such a fracture. Vertical diplopia is a highly suggestive sign, and inability to elevate the eye makes the diagnosis very likely. It is also possible to have difficulty in depressing the eye. It is important in evaluating the diplopia to determine whether the objects are separated vertically rather than horizontally; horizontal diplopia is of no significance in the diagnosis of a floor fracture. The forced duction test is very valuable in demonstrating inferior rectus trapping and can be performed under local anesthesia.

Surgical repair can be accomplished by either the orbital approach or by a Caldwell-Luc procedure, or by a combination of both. The Caldwell-Luc procedure alone is probably an inferior method of repair because there is no assurance that trapped muscles have been freed from the fracture. A wide variety of implant materials have been employed, but Silastic or Supramid sheeting is generally available and, in general, either has proved to be satisfactory.

8. Hyphema

Traumatic hyphema following blunt injury is extremely common. The preferred treatment is five days of absolute bed rest and binocular patching. Neither mydriatics nor miotics should be used. Mild sedation is desirable.

Glaucoma following secondary hemorrhage should be treated conservatively if possible, with Diamox, elevation of the head of the bed, and glycerol or mannitol as needed. If the intraocular pressure persists at dangerous levels, surgery must be performed. Paracentesis may be performed initially, but results are often disappointingly short-lived. A corneoscleral section with removal of the clot by irrigation is much more likely to produce a lasting cure.

9. Corneal Foreign Bodies

Most corneal foreign bodies can be removed without difficulty. Extremely deep foreign bodies which are likely to produce loss of the anterior chamber on attempted removal, however, should probably be evacuated to a facility where removal can be performed in the operating room with the aid of an operating microscope.

10. Proptosis

Proptosis secondary to retrobulbar hemorrhage ordinarily requires no treatment. Rarely, however, the proptosis is so severe that lid closure is impossible, and there is corneal exposure. Lid closure must be achieved for corneal protection. If the lids cannot be held closed with a pressure patch, temporary suturing of the lids together or even an intermarginal tarsorrhaphy may be necessary. In extreme cases, it may be necessary to incise the orbital septum to allow evacuation of the clot.

Nonspecialized Management of Ophthalmic Injuries

1. Initial Examination

The basic problem in the evaluation of a casualty is to determine the gravity of the ocular injury. Eyes will fall into one of four groups:

1. Normal
2. Injury minor, not requiring evacuation to specialist.
3. Injury major but reparable, requiring evacuation to a specialist as promptly as possible.
4. Injury major and not reparable, requiring evacuation but not as urgently as group 3.

Usually the most difficulty is encountered in separating group 3 from group 4, and indeed this is often difficult for an ophthalmologist.

The basic question is whether the eye is useful. Any eye which perceives light is certainly useful, and every effort must be directed toward saving it. Even a totally blind eye is useful if it is a relatively normal-appearing eye because such an eye is usually cosmetically much more acceptable than a prosthesis.

A. Visual Acuity.

If the patient is unable to voluntarily open his eyelids, they should be opened with gentle pressure by the examiner. Great care must be exercised to apply pressure only on the orbital rims, and not on the globe itself. Direct pressure on the globe itself can result in further prolapse of intraocular contents through a corneal or scleral laceration.

The opposite eye is covered firmly with the examiner's hand, and the patient is asked if he can see a bright light, held very close to the eye. If there is doubt, the patient should be quizzed as to whether the light is on or off. If light perception is present, he is asked if he can detect the movement of a hand a few inches before his eye, and then to count fingers held about a foot away.

B. Basic Condition of Globe.

Initial inspection may reveal an obvious corneal or scleral laceration or a complete collapse of the globe with loss of intraocular contents. There may be obvious signs such as a hyphema, an irregular pupil, or foreign bodies. The globe may be palpated very gently through the eyelids to determine the basic firmness. Whether a globe has maintained its basic shape and firmness is usually a much better prognostic sign than is the apparent size of a laceration or the presence of a hyphema.

A corneal laceration is usually signaled by distortion of the pupil with prolapse of iris tissue through the laceration. A scleral laceration often presents the same finding, and will always appear jet black, due to the presence of heavily pigmented uveal tissue lying immediately beneath the sclera. With large lacerations there may be extensive prolapse of intraocular contents and collapse of the globe, making repair impossible. Whether or not a globe has maintained its basic shape and firmness is a much better prognostic indicator than is the apparent size of the laceration.

2. Interim Management

Corneal and scleral lacerations which are judged to be reparable should be taken to surgery as soon as possible, but if the patient's life is in serious jeopardy because of other injuries, a delay of 72 hours is acceptable. After the initial ocular examination, a sterile patch should be kept on the eye, and systemic antibiotics must be started. Topical drops or ointments should be avoided and no interim surgery should be attempted.

If an eye is judged to be hopelessly destroyed, a longer delay can be tolerated, although prompt surgery is still desirable. If the eye is kept covered and the patient is maintained on prophylactic antibiotics, a delay up to 7–10 days is acceptable.

3. Sympathetic Ophthalmia

Sympathetic ophthalmia is a chronic, severe inflammation induced in the normal fellow eye following penetrating injury to the globe. Appearing two weeks or more following injury, it is thought to be produced by an autosensitization to uveal pigment released by injury to the uveal tract. Although it is a very rare disease, it is devastating. It can be prevented by removing the injured eye during the first 10 days after injury, and in the vast majority of cases the safety period is even longer. The threat of sympathetic ophthalmia does not alter the approach to the treatment of ocular injuries if the eye has salvage potential, but if an eye is destroyed, early removal is mandatory. A destroyed eye, in this sense, must be considered a dangerous eye, and removal should not be delayed beyond the first 10 days.

4. Foreign Bodies

The presence of an intraorbital or intraocular foreign body on X-ray does not alter the interim management, and it also does not alter the urgency for medical evacuation. No attempt should be made to remove either an intraorbital or intraocular foreign body prior to evacuation to an ophthalmologist.

5. Antibiotics

Infections constitute a formidable problem in Vietnam, and many eyes have been lost because of intra-

ocular infection. Prophylactic antibiotics are essential in the treatment of a penetrating ocular injury, and even with the use of prophylactic antibiotics, infections have continued to occur. As has been the case in general surgery, gram-negative rods have been the principal offenders.

The choice of antibiotics for ocular prophylaxis is complicated by the fact that many commonly used antibiotics do not penetrate the noninflamed eye in any significant concentration. Penicillin and streptomycin, for example, are poor choices because of their poor ocular penetration. The best drugs and their dosage are as follows:

chloramphenicol 500 mg. q6h p.o. or IV push
ampicillin 500–1000 mg. q6h p.o., IM, or IV
cephaloridine 1 g. q6h IM or IV

6. Lacerations of the Eyelids

Lacerations of the eyelids are basically handled in the same manner as are lacerations of the face. For proper function, however, correct anatomic approximation is essential, and for this reason repair by an ophthalmologist is desirable, particularly if the laceration involves the lid margin. Lacerations involving the lacrimal canaliculi require special techniques for repair.

A delay of up to 72 hours is acceptable in the repair of lid lacerations, although the risk of infection is greatly increased, and prophylactic antibiotics are indicated. If repair must be performed prior to evacuation, débridement should be minimal, and every effort should be made to properly approximate the lid margin. Closure should be made in two layers, using catgut sutures to close the conjunctive-tarsal plate and fine silk to close the skin. If the cornea is exposed because of tissue loss, use 4–0 silk to approximate any tissues available for temporary cover. Copious antibiotic ophthalmic ointment should be applied frequently to cover any exposed area. Prolonged exposure is dangerous, and prompt medical evacuation is indicated.

7. Minor Injuries

Certain minor eye injuries can be handled without the aid of a specialist.

A. Corneal Abrasions.

The patient should be treated with a drop of homatropine (2% or 5%) or scopolamine 1/4% initially, Neosporin drops or ointment and a patch. The patch may be discontinued when the patient is comfortable.

Continued use of topical anesthetics to make the patient comfortable is contraindicated. These agents are toxic to the corneal epithelium and significantly delay healing.

B. Corneal Foreign Bodies.

Corneal foreign bodies can usually be removed easily after the instillation of a topical anesthetic. Removal should first be attempted with a cotton applicator. If this is unsuccessful, a hypodermic needle should be used to flick out a particle which is superficially embedded. If the foreign body proves to be deep or difficult to remove, the patient should be evacuated to an ophthalmologist.

Following removal of a foreign body the treatment is the same as for a corneal abrasion.

C. Thermal Burns.

Thermal burns are treated in the same manner as corneal abrasions. A topical steroid-antibiotic solution or ointment, such as NeoDecadron or Cortisporin may be used.

D. Chemical Burns.

Chemical burns of the cornea and conjunctiva are treated with immediate irrigation with normal saline or water (preceded by the instillation of a topical anesthetic), and removal of any particulate matter such as chemical particles. Otherwise the treatment is the same as for a corneal abrasion.

Caustic burns (lye, quicklime) are potentially very destructive and such cases should be evacuated promptly, particularly if there is corneal clouding. Copious irrigation for at least 30 minutes must be performed prior to medical evacuation, however.

E. Subconjunctival Hemorrhage.

Subconjunctival hemorrhage is often frightening in appearance but is rarely of any consequence. It can occur spontaneously or as a result of minor trauma. In casualties it is most often seen as a manifestation of retrobulbar hemorrhage and is often associated with a periorbital hemorrhage. No treatment is necessary.

F. Hyphema.

Hyphemas are potentially dangerous, and most should be treated by an ophthalmologist if evacuation is feasible. If evacuation is not possible, treatment should consist of absolute bed rest and bilateral eye patches for five days. It is necessary to continue bed rest for five days, even if the hyphema is resolved in order to minimize the risk of a secondary hemorrhage which often is massive. Should a secondary hemorrhage occur, the increased amount of blood in the anterior chamber will be apparent, and

(Continued on page 19)

INTERVAL AT SEA-LEVEL PRESSURE REQUIRED TO PREVENT DECOMPRESSION SICKNESS IN HUMANS WHO FLY IN COMMERCIAL AIRCRAFT AFTER DIVING

Peter O. Edel, Joseph J. Carroll, Robert W. Honaker, and Edward L. Beckman, J & J Marine Diving Company, Inc., Pasadena, Texas 77502, and National Aeronautics and Space Administration, Manned Spacecraft Center, Houston, Texas 77058. *Aerospace Med 40(10): 1105–1110, October 1969.*

An investigation was undertaken to determine the susceptibility to decompression sickness in humans who breathe air while under increased pressure (as in scuba diving) and who then are exposed to an interval of decreased pressure (as in commercial airline flight).

In order to evaluate the degree to which the nitrogen content of the fast, medium, and slow half-saturation-time tissues control the occurrence of bends in decompression to altitude after diving, three different pressure-time profiles were tested. The profiles were selected from the "No-decompression limits and repetitive group designation table" of the U.S. Navy Diving Manual. The interval spent at sea level after the exposure to pressure and prior to ascent to altitude was varied from five minutes to five hours. The frequency and severity of any decompression sickness that occurred were determined, and guidelines were thereby established to safeguard divers against decompression sickness when they fly in commercial aircraft after diving.

In 1961 a report was published concerning an in-flight incident wherein several members of the crew of a commercial aircraft on an intercontinental flight suffered, unaccountably, decompression sickness. The crewmembers involved had been scuba diving for several hours during the morning and afternoon of the flight in question. Although decompression sickness has rarely afflicted airline passengers or flight crews during flight, the health hazards and financial liability involved in a single such incident make further investigation of this problem necessary.

Using the techniques of Reeves and Beckman, Furry, et al., conducted experiments in 1967 to determine the bends threshold of male dogs. The magnitude of simulated seawater pressure that the animals could sustain for seven hours and then be decompressed immediately to surface pressure without incurring more than a 50 percent probability of developing bends was thereby empirically demonstrated. When the bends threshold—the seawater pressure—had been individually determined, the dogs were exposed to that critical pressure for another seven-hour period. After this interval, they remained for various lengths of time at surface pressure before being exposed to a simulated altitude of 10,000 feet, so that the frequency with which bends occurred might be tabulated. Under the conditions of these experiments, the following correlations emerged:

Number of Animals	*Interval Surface*	*Probability of Bends*
14	1 hour	93%
10	3 hours	30%
18	6 hours	28%
10	12 hours	0%

The present investigation was undertaken to determine the susceptibility to decompression sickness in humans who breathe air while under increased pressure (as in scuba diving) and who then are exposed to an interval of decreased pressure (as in commercial airline flight). Pressure-time profiles were selected from "No-decompression limits and repetitive group designation table" of the U.S. Navy Diving Manual, as calculated by Workman. The interval spent at sea-level pressure was varied during the experimentation, and then was followed by further decompression to the equivalent of the maximum in-flight cabin altitude pressure of commercial aircraft, i.e., 8000 feet.

Methods

Experienced divers—volunteer, commercial, and amateur—served as subjects in these experiments. The age, height, and weight, in addition to the surface area and body specific gravity of each subject (as determined from standard nomograms) are tabulated in Table I.

The subjects were compressed in a double-lock pressure chamber at a specific seawater pressure and for a given length of time, according to the pressure-time profile being tested. After the specified length of time in the chamber, each subject was decompressed to sea-level pressure, and remained so for a preselected time interval. The subjects were then transferred to a smaller chamber in which the pressure was decreased, at a rate equivalent to ascent at 1000 feet per minute, to a maximum of 8000 feet.

TABLE 1. PHYSICAL CHARACTERISTICS OF SUBJECT POPULATION

Subject	Age (Years)	Weight (Pounds)	Height (Inches)	Surface Area (M_2)	Body Specific Gravity
E.B.	51	174	70	1.92	1.075
P.E.	39	131	66	1.66	1.089
J.C.	44	155	71	1.88	1.103
M.C.	21	150	71	1.86	1.091
V.V.	49	177	68	1.94	1.069
E.S.	42	145	69	1.80	1.089
F.B.	28	192	69	2.04	1.062
R.R.	22	170	73	2.00	1.090
B.H.	35	185	73	2.08	1.078
B.Mc.	31	148	72	1.86	1.098
D.D.	30	200	72	2.15	1.084
Mean	35.6	166.1	70.4	1.93	1.084

At each simulated level of altitude, the subjects were evaluated for any symptoms of decompression sickness, and then were maintained at the 8000-foot altitude pressure for 112 minutes. A further decompression, at an aircraft rate of ascent of 1000 feet per minute, to a simulated altitude of 16,000 feet was then carried out to test the presence of "silent" bubbles in any body tissue, and to magnify any vague symptoms that might have manifested themselves at lower altitudes. This altitude pressure was maintained for a period of five minutes, after which time the subjects were recompressed to sea-level pressure.

Air was the breathing mixture used throughout the test exposures, so that nitrogen was the only inert gas under scrutiny in evaluating any decompression sickness that occurred. After the initial period of exposure to simulated depths, during which time the critical uptake of nitrogen into the tissues occurs, only the length of the decompression interval at surface pressure was individually varied. Since this surface interval was the controlling factor in the elimination of nitrogen from the tissues, it also controlled the probability of an attack of decompression sickness when the subject was further decompressed to an altitude pressure of 8000 feet.

Three types of pressure-time profiles (Table II) were selected from the U.S. Navy's "No-decompression" diving table to ensure nitrogen tissue tensions that would be safe against bends upon the subjects' return to sea-level pressure, but that would be sufficiently high to cause bends if the ambient pressure were further decreased to altitude pressure much less than that at sea level.

Test Condition #1 was a 120-foot "No-decompression" dive lasting 15 minutes. This pressure-time profile was chosen as the one that would elevate the nitrogen partial pressure in the 5-, 10-, 20-, and 40-minute half-saturation-time tissues* to critical

* Assuming that the inert-gas saturation of a body tissue is in equilibrium with that of the breathing mixture, the half-saturation-time of a tissue is the length of time required for the tissue to reflect 50 percent of any change occurring in the partial pressure of the inert gas in the breathing atmosphere.

TABLE II. PARAMETERS OF TEST CONDITIONS EVALUATED

Test condition	Pressure, feet seawater (FSW)	Duration under pressure	Subject activity	Surface interval tested	Limiting Half-saturation-time tissue
1	120	15 min.	Working	5, 30 min.	5-, 10-, 20-, 40-min.
2	40	200 min.	Resting	5, 30 min., 1, 2, 3 hrs.	80-, 120-, 160-min.
	40	200 min.	Working	5, 30 min.	
3	33	24 hrs..		2, 5 hrs.	240-, 360-min.
	30	24 hrs..		2 hrs..	

levels. After surface intervals of 5 or 30 minutes, the subjects were tested according to the altitude pressure-time profile described above to determine whether sufficient nitrogen desaturation had taken place to allow safe simulated ascent to the 8000 feet. The subjects worked continuously during this dive by pulling a 70-pound elastic the distance of one foot 300 times, or lifting a 40-pound weight 1.5 feet 200 times, which was the minimum workload during the 15-minute dives. More robust subjects did more work. The exact work level was calculated to maintain each subject's heartbeats at a rate higher than 120 a minute. This work rate was selected in order to double the subjects' cardiac output in a working situation, which doubles the rate at which blood is perfused through the tissues of the body. Since the rate of nitrogen uptake in bodily tissues is thought to be limited by the rate at which the tissues are perfused with blood, doubling the perfusion rate causes a comparable increase of nitrogen uptake in the tissues.

The pressure profile of Test Condition #2 was selected because it would produce high levels of nitrogen saturation in the 80-, 120-, and 160-minute half-saturation-time tissues. This pressure schedule was a standard "No-decompression" dive lasting 200 minutes at a pressure equivalent to that at 40 feet of seawater (FSW). Surface intervals of 5 and 30 minutes, and of 1, 2, and 3 hours were used in this series of tests.

The initial experiments under Test Condition #2 were performed while the subjects were at rest. The same pressure-time profile was then used while the subjects worked so that differences in the effects of resting and working situations might be compared. Only 5- or 30-minute periods of denitrogenation on the surface were tested after the working dives.

The working dive consisted of 15-minute work periods alternating with 15-minute intervals of rest. The workloads were the same as those used in Test Condition #1.

Test Condition #3 was designed to produce a high level of nitrogen partial pressure in the 240- and 360-minute half-saturation-time tissues. A "No-decompression" dive to 33 feet for 24 hours was used in the first four tests in this series, and was modified to 30 feet for 24 hours for two additional tests. Effectiveness in bends prevention of 2- and 5-hour surface intervals between exposure to depth pressure and altitude pressure was then evaluated. Any occurrence of decompression sickness was recorded. The severity of any symptom was evaluated by each individual subjectively and by the two chamber operators, both groups using the following scale (the highest degree of severity being 4):

Type	*Severity*
1. Cutaneous itching	1- to 4-plus
2. Joint pain (bends)	1- to 4-plus
3. Neurological symptoms	1- to 4-plus
4. "Chokes"	1- to 4-plus

Because of the evanescent nature of the pains associated with 1-plus bends, no low-order pain that persisted for less than 15 minutes was so catalogued.

Results

The results of the 120-foot, 15-minute dive (Test Condition #1) are summarized in Table III (not shown). None of the subjects developed bends at the simulated altitude of 8000 feet, and only one suffered bends upon further decompression to 16,000 feet.

As a result of the 24 test dives conducted at the simulated depth of 40 feet and lasting 200 minutes (Test Condition #2), during which time no physical work was performed, only one case of bends occurred. This single case developed in the subject who remained at surface only five minutes before being decompressed to the 8000-foot simulated altitude. His pain regressed during the 112-minute stay at 8000 feet, but while he was being further decompressed, the pain intensified and became sufficiently severe at 10,000 feet to necessitate his return to sea-level pressure. Most subjects experienced cutaneous itching under no-work conditions during decompression to altitude, which was not categorized as bends according to the definitions used in this study. The results of these dives are tabulated in Table IV.

The results of 200-minute simulated dive to 40-FSW pressure during which the subjects worked are shown on Table V. Only one subject who worked during this pressure exposure developed bends pain (2-plus in the left elbow), after 20 minutes at 8000 feet following a five-minute surface interval. His pain eventually disappeared at that altitude; but 2-plus pain in the wrist occurred just prior to further ascent, and necessitated the subject's return to surface after he had reached an altitude pressure of 14,000 feet. Of interest is the fact that under identical circumstances in Test Condition #2, those subjects who merely rested during the dive suffered significantly from itching—lasting for 15 to 60 minutes—while those who worked experienced essentially none of these sensations.

TABLE IV. RESULTS OF VARIOUS SURFACE INTERVALS AFTER 200-MINUTE DIVE FOLLOWED BY DECOMPRESSION TO 8000-FOOT AND 16,000-FOOT PRESSURE ALTITUDE. *SUBJECTS AT REST.* (TEST CONDITION #2)

Surface Interval	Subject	8000 Ft. Itch	8000 Ft. Pain	16,000 Ft. Itch	16,000 Ft. Pain (upon arrival at)	Residual
	V.V.	+			+++ 11,000 Ft.	None
	B.H.	+			+++ 14,000 Ft.	Soreness 24 hrs.
	J.C.	++				
5 mins.	M.C.	++	++++ (Regressed)	++++		Soreness 24 hrs.
	E.B.	++++			+++	None
	P.E.	++++			+++	
	E.B.	++		+	+++	None
	P.E.	++				None
30 mins.	J.C.	++				None
	B.H.					None
	E.B.	++++				Pain R knee
1 hr..	P.E.	++++			++	Residual next a.m.
	J.C.	+		++		None
	B.H.					None
	J.C.	++				None
	B.H.	++				
2 hrs..	E.B.	+		++		None
	P.E.	+			++++	
	E.B.					
	P.E.					
	J.C.					
3 hrs..	B.H.					
	M.C.	+				
	B.Mc.					

The results of the 24-hour test dives to simulated depths of 30 to 33 feet (Test Condition #3) are shown in Table VI. Two subjects were first compressed to 33-FSW pressure, followed by a two-hour interval at surface pressure. Both subjects had pain upon further decompression to 8000 feet. One subject developed 4-plus pain in his left knee, which necessitated his immediate recompression to surface pressure. The pain was relieved at surface; but it recurred within four hours, and persisted for 12 hours before spontaneously subsiding. The other subject felt only fleeting pains in both knees at 8000 feet, but developed severe knee pain upon further decompression to 11,000 feet, which required his recompression to sea-level pressure.

These same subjects repeated the 33-foot, 24-hour dive profile following it with a five-hour rather than a two-hour surface interval. One subject developed 1-plus pain in his right knee after four hours at surface following the second dive. The pain intensified upon further decompression, becoming 4-plus at 5000 feet. The subject was recompressed to sea level, but experienced little relief; treatment according to U.S. Navy Treatment Table #5, however, produced complete remission of symptoms.

Under Test Condition #3, two other subjects were exposed to 30-FSW pressure for 24 hours, and were then given a two-hour period of surface decompression. These subjects experienced no definable symptoms while they were at sea level, but both developed 4-plus pain in the knees upon decompression to 8000-foot altitude pressure, necessitating their recompression to surface pressure. One of these two subjects was recompressed after only four minutes at the 8000-foot pressure, and the other after 29 minutes. Both subjects developed bends pain in their knees within three hours of recompression to sea-level pressure, but treatment according to the U.S. Navy Treatment Table #5 brought about complete relief.

Discussion

The small number of divers who developed bends after being exposed to standard "No-decompression" diving profiles followed by ascent to simulated altitude was not anticipated. Based upon standard U.S.

TABLE V. RESULTS OF 5- AND 30-MINUTE SURFACE INTERVALS AFTER 200-MINUTE DIVE FOLLOWED BY DECOMPRESSION TO 8,000-FOOT AND 16,000-FOOT PRESSURE ALTITUDE. *SUBJECTS WORKING*, (TEST CONDITION #2)

Surface Interval (in Minutes)	Subject	Symptoms at 8000 ft. Itch	Symptoms at 8000 ft. Pain	Symptoms at 16,000 ft. Itch	Symptoms at 16,000 ft. Pain
30	P.E.	0	0	0	0
30	E.B.	0	0	0	0
5	P.E.	0	0	0	0
5	E.B.	0	0	0	0
5	B.H.	0	0	0	0
5	J.C.	0	0	0	0
5	F.B.	0	0	0	0
5	D.D.	0	After 20 min. ++ left elbow, which regressed; after 112 min., ++ left wrist	0	++++ pain at 14,000 ft.; test aborted

Navy diving tables, a larger number of subjects would have been expected to develop symptoms of decompression sickness. A summary of the incidence of bends in these experiments is shown in Table VII.

Under Test Conditions #1, dives lasting 15 minutes were, on a theoretical basis, expected to result in high but acceptable nitrogen tissue tensions in the 5-, 10-, 20-, and 40-minute half-saturation-time tissues. These tissue tensions were expected to decay within a minimum surface interval of five minutes, plus the eight-minute ascent time to 8000 feet, to a marginal nitrogen level in the tissues that would be safe against decompression sickness on arrival at altitude. The subjects' nitrogen tissue tensions after their return to surface pressure following the dive and at the time of decompression to simulated altitude, as determined by the method of calculation used in the present study, are shown in Figure 1. The results of these tests indicate that this method of calculating the partial pressure of nitrogen in the tissues is valid and is equally applicable to diving and altitude pressures, since no cases of bends occurred in these series.

According to customary calculations, the 200-minute simulated dive to 40 feet followed by a surface interval of 30 to 60 minutes (Test Condition #2) would have been expected to cause sufficiently high nitrogen concentration in the 80- to 120-minute

TABLE VI. RESULTS OF VARIOUS SURFACE INTERVALS AFTER 24-HOUR 33 FSW DIVE FOLLOWED BY DECOMPRESSION TO 8000-FEET AND 16,000-FOOT PRESSURE ALTITUDE. (TEST CONDITION #3)

Subject	Depth	Surface Interval	Symptoms, 8000 Ft.	Symptoms, Ascent to 16,000 Ft.	Post-Decompression Symptoms
P.E.	33′	2 hrs.	++++ L knee (forced descent)		Recurrence 4 hrs. after return to surface
E.B.	33′	2 hrs.	+ Both knees	+++ at 11,000 ft. (forced descent)	
P.E.	33′	5 hrs.	+ Pain R knee at surface; ++++ at 5000 ft. (forced descent)		Complete remission after treatment (Oxygen Treatment Table #5)
E.B.	33′	5 hrs.	+ Pain R knee (disappeared in 1 hr.)	+++ Pain both knees 11,000 ft (forced descent)	
B.H..	30′	2 hrs.	++++ L knee (forced descent)		Recurrence after 3.5 hrs., +++ L knee, ++ L shoulder
J.C.	30′	2 hrs.	++++ L knee (forced descent)		++ L knee, + L arm

TABLE VII. INCIDENCE OF BENDS (PAIN ONLY) UPON DECOMPRESSION TO ALTITUDE UNDER VARIOUS TEST CONDITIONS

Pressure Profile	Surface Interval	Number Subjects	Bends Pain 8000 ft.	Bends Pain 16,000 ft.
120 ft. for 15 min.	5 min.	5	0	1
	30 min.	4	0	0
40 ft. for 200 min. (Resting)	5 min.	6	1	4
	30 min.	4	0	0
	1, 2, 3 hrs.	14	0	1
40 ft. for 200 min. (Working)	5 min.	4	1	1
	30 min.	2	0	0
33 ft. for 24 hrs.	2 hrs.	2	2	—
	5 hrs.	2	2	—
30 ft. for 24 hrs.	2 hrs.	2	2	—

half-saturation-time tissues to induce bends when the subjects were further decompressed to 8000 feet. The nitrogen tensions of the 80-, 120-, 160-, and 200-minute half-saturation-time tissues as calculated for this dive, are shown in Figure 2. Of the subjects involved, 24 rested and eight worked during this pressure exposure; of these, six in the resting group and six in the work group were given a surface interval of just five minutes. Only one subject in each group developed bends upon decompression to the 8000-foot altitude pressure.

The results of Test Condition #2 indicate that the rates of nitrogen elimination from the 80-, 120-, 160-, and 200-minute half-time tissues are sufficiently rapid to permit safe decompression to 8000-foot altitude pressure after five minutes at surface. In Test Condition #1, this same surface interval proved to be equally safe against bends when the shorter (5-, 40-minute) half-saturation-time tissues were involved. The results of Test Conditions #1 and #2 suggest that following compressed-air diving —when carried out according to standard U.S. Navy table for "No-decompression" dives—only 16.6% of those whose physical condition matches that of the subject population in these experiments can be expected to develop bends if they fly in a commercial aircraft within five minutes after diving. This percentage can be reduced to zero for a population of the same physical characteristics if a 30-minute surface decompression interval is allowed. In order to ensure maximum safety, a surface interval four times as long, or two hours, should be allowed before a less select group of divers attempts flight in commercial aircraft.

The 24-hour dive—Test Condition #3—at seawater pressure of 33 feet (29.4 psia) was expected to produce 99 percent nitrogen saturation of the 240-minute half-saturation-time tissue, and 97 percent nitrogen saturation of the 360-minute tissue. Recognized diving practices dating back to Haldane accept direct surfacing after a dive to a maximum of 33 feet as being safe. However, calculations of nitrogen tissue tensions in these present studies predicted, and the results empirically demonstrated, that the nitrogen tension in the slowest tissue, after 24 hours at 33 FSW, will be high enough to produce bends in some individuals when they surface.

Based upon these calculations of nitrogen tissue tension following a 24-hour, 33-FSW pressure exposure, the prediction was also made that bends almost certainly would occur in most subjects upon decompression to 8000-foot altitude, even after a two- or five-hour surface interval. The theoretical nitrogen tensions in the 240- and 360-minute tissues during the 24-hour experimental pressure exposures are plotted in Figure 3. The results of Test Condition #3 confirmed the predictions made in that one subject developed 1-plus bends pain in the right knee at surface pressure after four hours, and the other three developed severe bends at 8000-foot altitude.

The 33-FSW pressure used in Test Condition #3 was therefore decreased to 30 FSW for the last test of this series. Although the two subjects involved did not develop bends during the two-hour surface interval, they did develop severe bends when they were decompressed to 8000 feet (as did the three subjects in the 33-FSW exposure) and had to be returned to surface pressure so that recompression therapy could be administered.

The experiences of the subjects in Test Condition #3 are directly comparable to those of commercial divers. In deep working dives of long duration, the diver's slowest half-saturation-time tissue (360 minutes) becomes the limiting one in his decompression to surface. Should commercial divers fly in a commercial airliner within a few hours of a long-duration deep dive, they can be expected to develop the same serious symptoms of decompression sickness suffered by the subjects in Test Condition #3. This syndrome is well documented in a case reported by Furry, et al., in which a commercial sponge diver developed decompression sickness while flying in an airliner, bound for London from Nicosia, that he boarded some 12 hours after he had been diving.

The same possibility of an attack of bends upon decompression to altitude exists in those divers who suffer decompression sickness after surfacing and who are then treated according to standard Navy Treatment Tables, because the treatment schedules are based on the 240- and 360-minute tissues as being the limiting ones. The test results indicate, therefore, that any diver who has suffered decompression sickness, whether or not it was treated by recompression, must allow a 24-hour denitrogenation period at surface pressure before he attempts flight in a commercial aircraft.

These tests also demonstrated the frequency with which bends attack the knees as a result of nitrogen supersaturation of the slowest half-time tissues. Furthermore, the tests corroborate the contention of some investigators that bends pain occurring in the knee following supersaturation of the slowest tissues is the one most resistant to treatment.

Oxygen did not relieve the symptoms in any of the

four cases in which it was used, perhaps because the pain in each instance increased quite rapidly and became severe enough to necessitate the subjects' recompression. The value of using oxygen in the treatment of decompression sickness occurring at altitude was therefore not satisfactorily evaluated in the present experimentation. Experience in these tests appears to indicate, however, that 100 percent oxygen inhalation should be commenced immediately that the symptoms manifest themselves—that is, when 1-plus pain is present—if any benefit from oxygen therapy is to be gained.

Conclusion

Scuba divers who stay strictly within the limits (depth-time) of the standard U.S. Navy's "No-decompression limits and repetitive group designation table for No-decompression dives," for a period not exceeding 12 hours, will not develop decompression sickness if, after diving, they allow a minimum two-hour surface interval before flying in a pressurized commercial aircraft.

Divers who make dives beyond these "No-decompression" limits should allow a surface interval of 24 hours before decompression to a commercial aircraft's cabin altitude pressure if they are to avoid the risk of the bends.

(The figures, table III and the references may be seen in the original article.)

(Continued from page 7)

internal carotid artery was occluded by gelatinous grayish-white tissue, the remaining cerebral arteries being normal.

In 1968, Lewin, in a review of vascular lesions following head injuries, presented a 47-year-old male who had been knocked off his bicycle by a car. The patient, when seen shortly after the accident, was unconscious with a right hemiplegia. Within two days full consciousness returned, but it was recognized that the patient was aphasic. A left carotid angiogram revealed an occlusion of the left middle cerebral artery near its origin. Two months after the accident repeat angiography showed little change except for more obvious collateral circulation. This patient survived with improving right hemiparesis but with a continued severe expressive aphasia. Hockaday, reporting from the military hospital in Wheatly, England, presented a 20-year-old soldier who, after being knocked out in a dance hall brawl, had right facial palsy and weakness of the right hand. Six weeks after the accident, arteriography revealed proximal obstruction of the left internal carotid artery. A second case of Hockaday's was that of a 21-year-old professional boxer who lost a fight on points. Forty-five minutes after the decision, the pugilist had motor aphasia and right hemiparesis. Arteriography revealed obstruction of the left internal carotid at the base of the skull. Three years after injury he continued to manifest weakness of the right upper extremity and almost complete lack of movement of the right forearm and hand. Fortunately, he was left-handed and motor aphasia was only transient (figs. 8, 9, and 11, not shown).

ACKNOWLEDGMENT

I wish to thank Mrs. E. Caroline Hawkins, R.R.L., Chief Medical Record Librarian, Naval Hospital, Camp Pendleton, California, for her assistance in the preparation of this manuscript.

(The references and figures not shown may be seen in the original article.)

(Continued from page 12)

the bleeding is usually accompanied by a sudden increase in pain. If the secondary hemorrhage does not completely fill the anterior chamber do not alter the therapy. If the hemorrhage does fill the anterior chamber, and the pain continues, prompt care by an ophthalmologist is mandatory because of the likelihood that severe secondary glaucoma is present.

G. Irregular Pupil.

Damage to the sphincter muscle of the iris is common following trauma to the eye. The usual manifestation is slight irregularity of the pupil and some dilatation. Light response is poor, but vision is unaffected. No treatment is necessary, although the condition is often permanent.

H. Traumatic Iritis.

Traumatic iritis is very common following trauma and often accompanies damage to the sphincter muscle. The symptoms are mild photophobia and redness. The iritis is self-limited and requires no treatment, although topical steroids can be used.

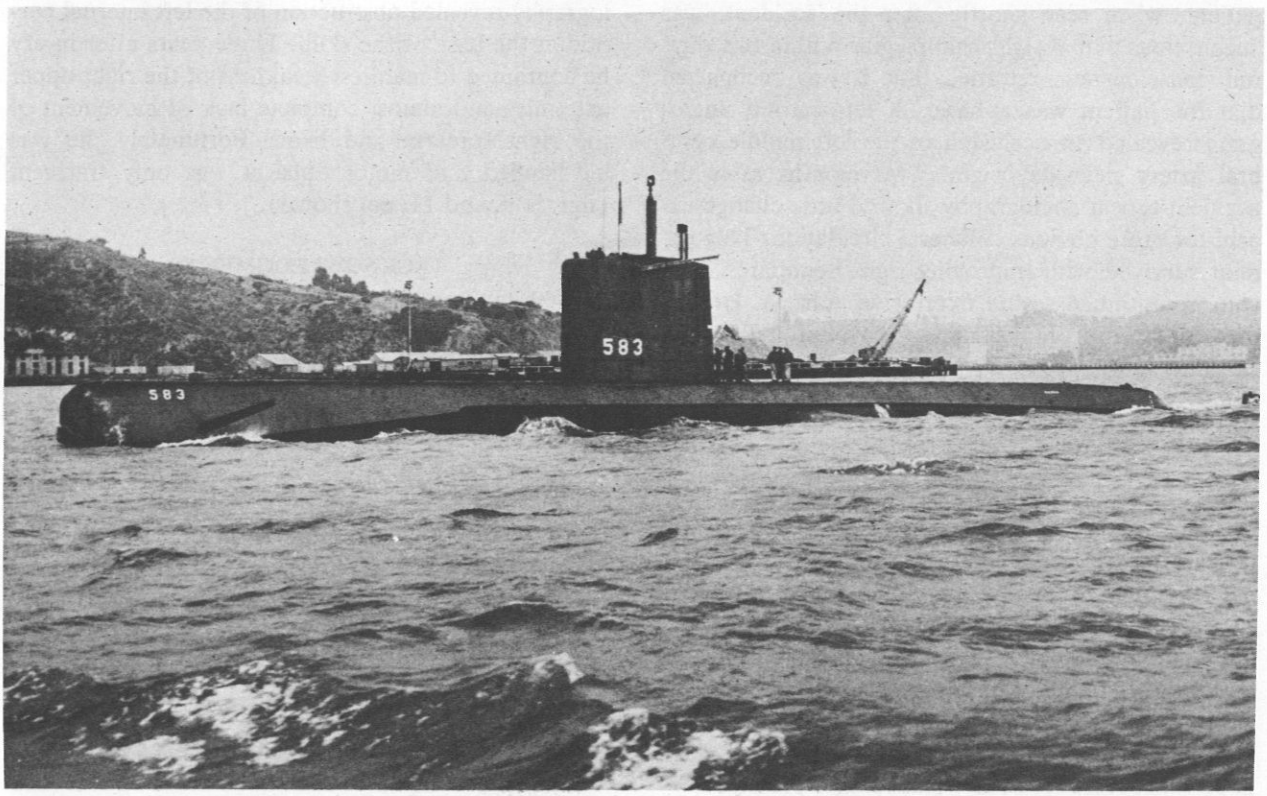
SCHOOL OF SUBMARINE MEDICINE

By HMCS(SS) R. D. Perry, USN, Senior Instructor; Naval Submarine Medical Center, Naval Submarine Base New London.

"The School for Pharmacists Mates Entering the Submarine Service" was established in the Spring of 1943 for the purpose of training Pharmacist Mates in the specialized medical department duties involved while serving on board submarines independent of a medical officer. At that time the course lasted six weeks, four weeks of academic studies and two weeks of practical work in the Submarine Base Dispensary.

Over a period of years the curriculum was altered and expanded to meet the needs of the modern Navy and the longer periods of deployment independent of a medical officer. In 1955 the requirement that the student be an HMB School graduate was dropped and the curriculum was extended to twelve weeks to include subjects that had been previously taught in HMB School.

Until it was moved to Bainbridge, Md., corpsmen going to nuclear powered submarines went through the enlisted nuclear power course. It was recognized that Submarine Hospital Corpsmen still needed specialized training in the nuclear field and in October 1962 the first Nuclear Medicine Technician class was convened for a period of twelve weeks. In the first class, 30 students were already qualified in subma-



USS Sargo (SSN 583) was the fourth nuclear-powered submarine in the world to become operational. Its predecessors are the NAUTILUS, SEA WOLF, and SKATE. It is a smaller, more maneuverable version of the NAUTILUS and is a sister ship of the SKATE.

rines and five were members of the graduating class of the Submarine Medicine Technician course.

In August of 1965 the Bureau of Medicine and Surgery approved the present Nuclear Submarine Medicine Technician course of 30 weeks' duration to commence with the January 1966 class. This included 12 weeks of nuclear medicine, ten weeks of submarine medicine and eight weeks of Enlisted Submarine School.

The hours of instruction currently are as follows:

Nuclear Medicine Section

Subject	Classroom	Practical	Total
Mathematics	70	0	70
Radiological Physics	70	0	70
Photodosimetry	42	63	105
Radiobiology	15	0	15
Health Physics Administration	10	0	10
Health Physics Environmental	33	9	42
Health Physics Instrumentation	22	15	37
Health Physics Weapons	15	17	32
Reactor Plant Technology	16	0	16
Totals	293	104	397

Submarine Medicine Section

Subject	Classroom	Practical	Total
Toxicology	6	0	6
First Aid and Minor Surgery	22	8	30
Dental	8	2	10
Administration	23	0	23
Preventive Medicine	20	1	21
Atmosphere Control	38	4	42
Diving Medicine	19	6	25
Medical Diagnostics and Treatments	104	50	154
NBC Warfare	6	0	6
Totals	246	71	317

In addition, field trips pertaining to each section are conducted. The remainder of the 30 weeks are spent in the Enlisted Submarine School where the curriculum covers the basic systems of a submarine with practical training on computerized simulators.

The prerequisites for selection for Nuclear Submarine Medicine training are:

1. HM2 through HMC
2. Volunteer for Submarine Duty
3. ARI/GCT combination of 110
4. Physically qualified in accordance with Article 15–29, Manual of the Medical Department
5. Secret security clearance.
6. High School Graduate or its equivalent
7. Thirty-six months obligated service upon commencing training.

Upon completion of the course of instruction the student will be assigned to a submarine in the Atlantic Fleet or Pacific Fleet.

The home ports for Atlantic Fleet submarines are New London, Conn.; Norfolk, Va.; Charleston, S.C.; and Key West, Fla. In addition, there are two advanced operational bases for Fleet Ballistic Missile Submarines. They are Holy Loch, Scotland and Rota, Spain. The crews of the submarines operating from the advanced bases are home ported either in New London or Charleston.

The home ports for the Pacific Fleet submarines are San Diego, Calif., and Pearl Harbor, Hawaii. The Fleet Ballistic Missile Submarines of the Pacific Fleet operate from Guam with the crew home ported in Pearl Harbor.

For additional information on this course see BUMED Instruction 1500.9 series or write to:

Commanding Officer
Naval Submarine Medical Center
Naval Submarine Base New London
Groton, Conn. 06340

SOFT-TISSUE SARCOMAS, BREAST CANCER, AND OTHER NEOPLASMS
A FAMILIAL SYNDROME?

Frederick P. Li, MD, and Joseph F. Fraumeni, Jr., MD, FACP, Bethesda, Maryland. *Ann Intern Med 71(4): 747–752, October 1969.*

Summary. Four families were identified in which a pair of children had soft-tissue sarcomas: three sets of sibs and one set of cousins. One parent of each affected child developed cancer; carcinoma of the breast occurred in three mothers under 30 years of age. Other young adults in these families had a high frequency of cancer, with no evidence of underlying genetic disorders known to carry a high risk of neoplasia. The increased familial susceptibility to cancer was manifested not only by the large number of members affected but by a seeming excess of multiple primary neoplasms. These findings suggest a new "familial" syndrome of neoplastic diseases in which heredity or oncogenic agents, or both, may have a causal role.

Recent interest has focused on the familial aggregation of certain malignant neoplasms. In this paper we report four families in which soft-tissue sarcomas in related children were associated with cancers of the breast and other organs among parents and relatives. This constellation of neoplasms may represent a new familial syndrome, with opportunities for etiologic study and early detection of the component tumors.

Methods

A kindred was referred for study when two cousins developed rhabdomyosarcomas in infancy (Family A). Interviews with parents and questionnaires mailed to other relatives provided a detailed family history.

We then reviewed the abstracts assembled from the medical charts of 280 children treated for rhabdomyosarcoma at 17 institutions. Two pairs of sibs with soft-tissue sarcomas were found, and with permission from their physicians the parents were interviewed to obtain additional genealogic data (Families B and C).

Family D was identified from the childhood cancer mortality registry described by Miller. When the records of the 418 children who died of rhabdomyosarcoma in the United States from 1960 through 1964 were matched by the child's last name and mother's maiden name, 1 sib pair was found. This family was not contacted, and further data were derived solely from hospital charts.

Efforts were made to confirm all reports of cancer by obtaining medical and mortality records and, whenever possible, by review of pathology specimens.

Findings

First-degree relatives of the proband and portions of the extended family are shown in Figure 1 (Family A) and Figure 2 (Families B, C, and D). Individuals with cancer are listed on Table 1. The occurrence of tumors was restricted to the paternal line of the proband in Families A and C and to the maternal line in Families B and D. There was no history of consanguinity or unusual environmental exposures. Parents with cancer were not exposed to therapeutic radiation or chemotherapy before the birth of an affected child.

Family A (Paternal Line)

The proband (V–1) developed rhabdomyosarcoma at 1 year of age. His father (IV–3) died of acute myelocytic leukemia at age 25, and the grandfather (III–1) had a basal and a squamous cell carcinoma of the skin.

A second cousin (V–7) of the proband also had rhabdomyosarcoma at 1 year of age; his mother (IV–8) had breast cancer at age 28, an aunt

Received March 10, 1969; revision accepted May 13, 1969.
From the Epidemiology Branch, National Cancer Institute, National Institutes of Health, Bethesda, Md.
Requests for reprints should be addressed to Joseph F. Fraumeni, Jr., MD, 410 Wiscon Bldg., National Institutes of Health, Bethesda, Md. 20014.

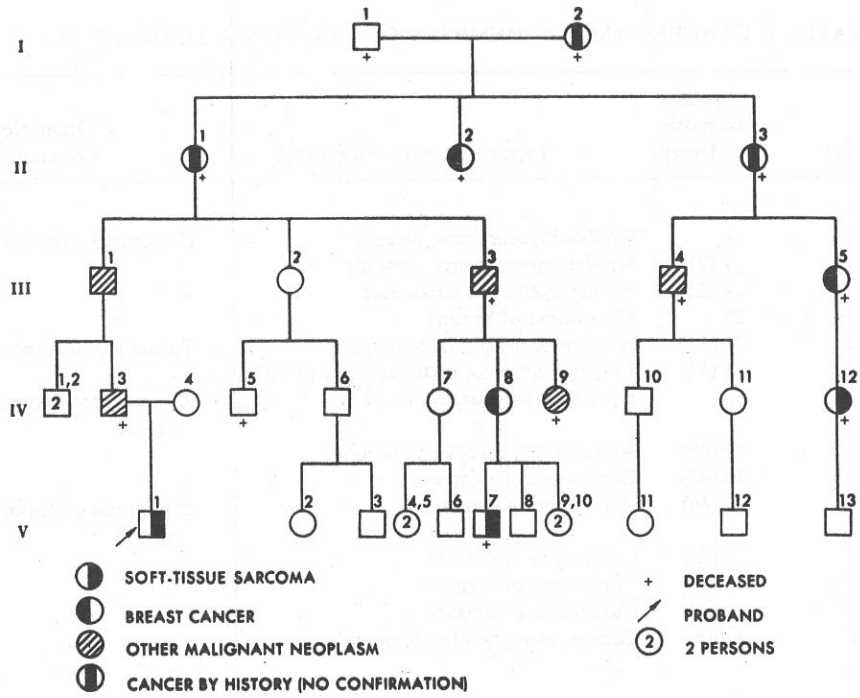


Figure 1. Pedigree of Family A.

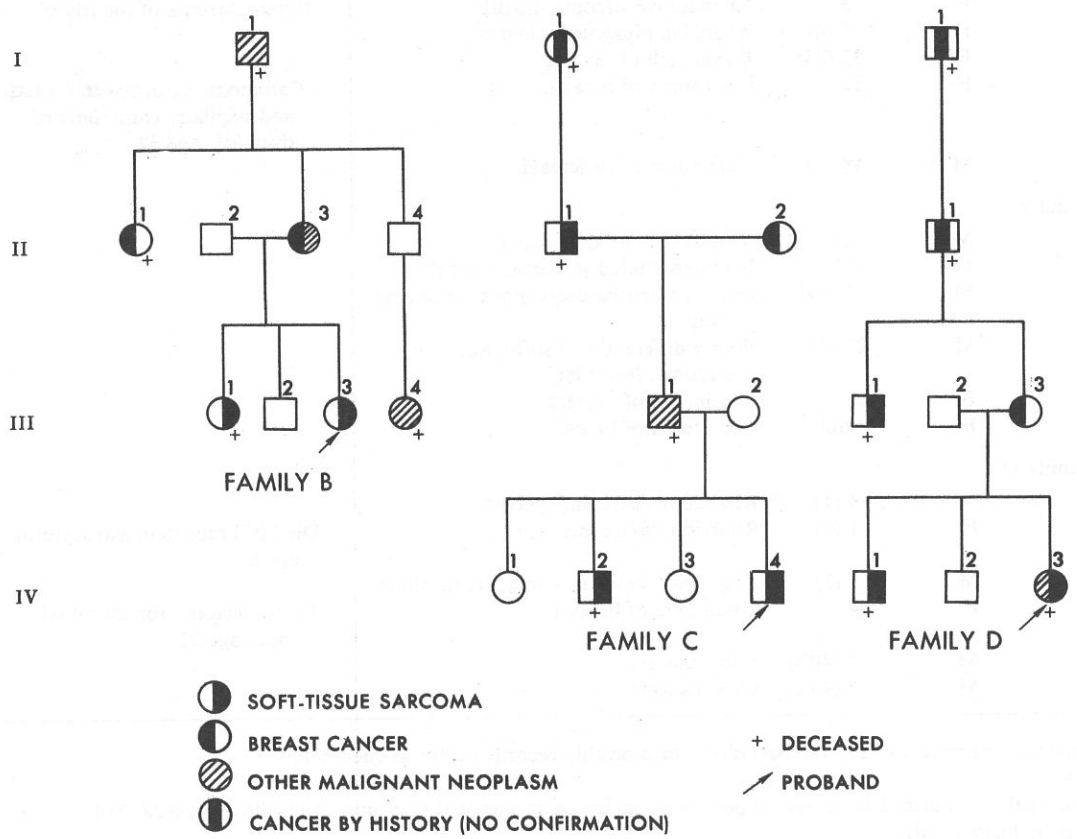


Figure 2. Pedigrees of Families B, C, and D.

TABLE 1. CANCERS AMONG MEMBERS OF FAMILIES A THROUGH D

Case	Sex	Age at Diagnosis (and Death)	Type of Primary Neoplasm*	Other Neoplasms or Associated Conditions
Family A				
V-1†	M	1	Rhabdomyosarcoma, biceps‡	Congenital pyloric stenosis
V-7	M	1 (2)	Rhabdomyosarcoma, deltoid‡	
IV-3	M	24 (25)	Acute myelocytic leukemia‡	
IV-8	F	28	Carcinoma of breast‡	
IV-9	F	23 (25)	Anaplastic neoplasm of lung‡	Turner's syndrome (45 X-0)
IV-12	F	32 (34)	Leiomyosarcoma, rectovaginal septum‡	
III-1	M	55	Squamous cell carcinoma of ear	Basal cell carcinoma of forehead, age 57
III-3	M	47 (48)	Alveolar cell carcinoma of lung‡	
III-4	M	30 (32)	Carcinoma of pancreas	
III-5	F	33 (46)	Carcinoma of breast.	Carcinoma of opposite breast, age 41
II-1	F	? (41)	Carcinoma of breast§	
II-2	F	? (40)	Carcinoma of breast	
II-3	F	? (32)	Carcinoma of breast§	
I-2	F	Adult	Cancer, primary site unknown§	
Family B				
III-1	F	1 (1)	Undifferentiated sarcoma, retroperitoneal area‡	
III-3*	F	3	Rhabdomyosarcoma, thigh‡	Heterochromia of the irises
III-4	F	5 (6)	Acute lymphocytic leukemia	
II-1	F	32 (33)	Carcinoma of breast‡	
II-3	F	22	Carcinoma of breast‡	Carcinoma of opposite breast‡ and papillary carcinoma of thyroid‡, age 34
I-1	M	48 (50)	Carcinoma of pancreas‡	
Family C				
IV-2	M	2 (3)	Spindle cell sarcoma, calf‡	
IV-4†	M	11	Undifferentiated sarcoma, buttock‡	
III-1	M	47 (49)	Disseminated basosquamous carcinoma, scalp	
II-1	M	22 (23)	Poorly differentiated soft-tissue sarcoma, lower leg	
II-2	F	80	Carcinoma of breast‡	
I-1	F	Adult	Carcinoma of breast§	
Family D				
IV-1	M	1 (1)	Rhabdomyosarcoma, pelvis‡	
IV-3†	F	1 (6)	Rhabdomyosarcoma, eye	Died of brain stem astrocytoma, age 6
III-1	M	2 (2)	Angioendothelial sarcoma, mediastinum	
III-3	F	24	Carcinoma of breast‡	Thyroidectomy for thyrotoxicosis, age 22
II-1	M	? (40's)	Lung cancer§	
I-1	M	? (40's)	Lung cancer§	

* All diagnoses confirmed by hospital, pathology, or mortality records except as cited below.
† Proband.
‡ Diagnosis further confirmed by review of pathology specimen at National Institutes of Health, Bethesda, Md.
§ Diagnosis by history only.

(IV–9) died of an anaplastic lung tumor at age 25, and the grandfather (III–3) had alveolar cell carcinoma of the lung.

A second cousin once-removed (IV–12) of the proband had leiomyosarcoma of the pelvis at age 32; her mother (III–5) had bilateral breast cancer, and an uncle (III–4) had carcinoma of the pancreas. Cancers were also reported in earlier generations of the family, but only one case, of breast cancer (II–2), was verified.

Family B (Maternal Line)

Soft-tissue sarcomas developed in the proband (III–3) at age 3 and in her 1-year-old sister (III–1). The mother (II–3) had breast cancer at age 22, before the birth of these children, and at age 34 developed cancer in the opposite breast and papillary carcinoma of the thyroid. A first cousin (III-4) had acute lymphocytic leukemia at age 5, an aunt (II–1) had breast cancer at age 32, and the grandfather (I–1) had carcinoma of the pancreas.

TABLE 2. SOFT-TISSUE SARCOMAS, BREAST CANCER, AND OTHER NEOPLASMS VERIFIED IN FOUR FAMILIES BY AGE AT DIAGNOSIS AND SEX

Cancer Age at Diagnosis (Sex)	Soft-Tissue Sarcoma	Breast Cancer	Other Neoplasms	Total
yr				
Under age 15 M	6	0	0	6
F	3	0	1	4
Age 15–40 M	1	0	2	3
F	1	6	1	8
Age 40 and over M	0	0	4	4
F	0	1	0	1
Total cases	11	7	8	26

Family C (Paternal Line)

Soft-tissue sarcomas were diagnosed in the 11-year-old proband (IV–4) and his 2-year-old brother (IV–2). Their father (III–1) died of disseminated basosquamous carcinoma of the scalp, the grandfather (II–1) had a poorly differentiated soft-tissue sarcoma of the lower leg at age 22, the grandmother (II–2) had breast cancer, and a great-grandmother (I–1) was reported to have breast cancer.

Family D (Maternal Line)

The proband (IV–3) had rhabdomyosarcoma of the orbit at 1 year of age and died at age 6 of a brain stem astrocytoma. A brother (IV–1) died of rhabdomyosarcoma at 1 year of age, the mother (III–3) had breast cancer at age 24 after the birth of both children, and an uncle (III–1) died of an angioendothelial sarcoma at 2 years of age. The grandfather (II–1) and a great-grandfather (I–1) were said to have died of "lung cancer" in middle age.

Discussion

The four kindreds described in this study appear to represent a familial syndrome of soft-tissue sarcomas in children and breast cancer and other neoplasms in young adults (Table 2). Each family had a pair of young children (three sets of sibs, one set of cousins) with soft-tissue sarcomas. The 3 sib pairs, ascertained from a survey of 649 children with rhabdomyosarcoma, surpass the occurrence of 0.06 pairs expected on a chance basis. In addition, a parent of each affected child had cancer—involving the breast in three mothers under 30 years of age and consisting of acute myelocytic leukemia and disseminated skin cancer, respectively, in two fathers. Relatives of the affected parents also had a high frequency of malignant neoplasms at a young age, particularly breast cancer and soft-tissue sarcomas. There were four instances of multiple primary neoplasms: bilateral breast carcinoma, bilateral breast carcinoma with papillary thyroid carcinoma, rhabdomyosarcoma and astrocytoma, and basal and squamous cell carcinomas of the skin. In addition, three patients had congenital defects: congenital pyloric stenosis with rhabdomyosarcoma, heterochromia of the irises with rhabdomyosarcoma, and XO Turner's syndrome with anaplastic malignancy of the lung.

It is well known that breast cancer tends to cluster in certain kinships and, as in the families of this report, occurs at an earlier age than in sporadic cases of this cancer. A familial association with soft-tissue sarcomas has been reported in two instances: breast cancer in the mother of an infant with rhabdomyosarcoma, and a family with breast cancer, various sarcomas, and other neoplasms. Furthermore, a report of rhabdomyosarcoma in the orbit of two sibs is the only evidence in the literature for familial aggregation of soft-tissue sarcomas during childhood. Sarcomas seem unduly frequent among individuals with inherited conditions such as tuberous sclerosis, multiple neurofibromatosis, basal cell nevus syndrome, Werner's syndrome (adult progeria), familial intestinal polyposis, and Gardner's syndrome, but there were no typical manifestations of these disorders in

(*Continued on page 38*)

TYPHOON JOAN

Story and photos by PH1 John R. Sheppard, USN

"It was the most worthwhile thing we have done during the entire seven-month cruise!"

This was the characteristic comment of the corpsmen and dental technicians who volunteered their services and skills to the victims of Typhoon Joan.

At a request from the Philippine government the Seventh Fleet Amphibious Ready Group "Alfa," the USS Okinawa (LPH–3), USS Duluth (LPD–6) and USS Anchorage (LSD–36) acted as floating bases and refueling pads from which the OKINAWA's embarked Marine Medium Helicopter Squadron 164 could fly over the washed-out roads and bridges, to deliver tons of much-needed rice, Bulgar wheat, and other foodstuffs donated by the Agency for International Development (AID).

Also needed was immediate medical attention for the thousands still suffering from the wrath of the typhoon which struck southern Luzon and Catanduanes Island with 130 mph winds. As soon as the call went out for medical aid, Navy corpsmen serving with the ships and with the embarked Marine landing team responded in the best traditions of the Naval service—they all wanted to help.

Medical boxes weighing approximately 150 pounds each, were rapidly filled while the air operations officer called in the "birds" to take the medical team to the staging areas in the towns of Virac and Naga. Green-clad corpsmen ran from embark shelters just below the flight deck and scampered up the steps into the whining CH–46 Sea Knight helos.

Victims of typhoon fly over washed-out roads in one of USS Okinawa's CH-46 helicopters to the towns of Virac and Naga where medical aid centers were set up by Navy Corpsmen serving with the OKINAWA's embarked Marine force.

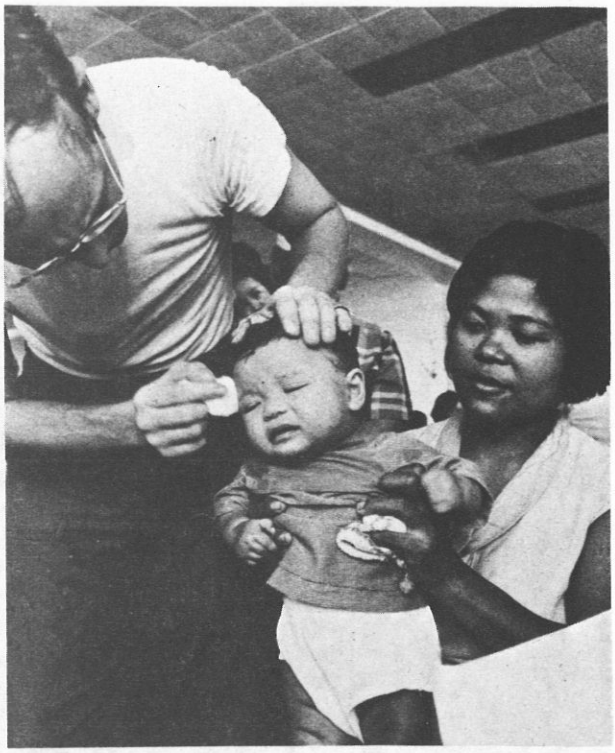
Flying low over the wind-stripped coconut and banana trees and the remains of Nipa huts typical of the housing in rural areas, the helos dropped sharply into makeshift landing areas.

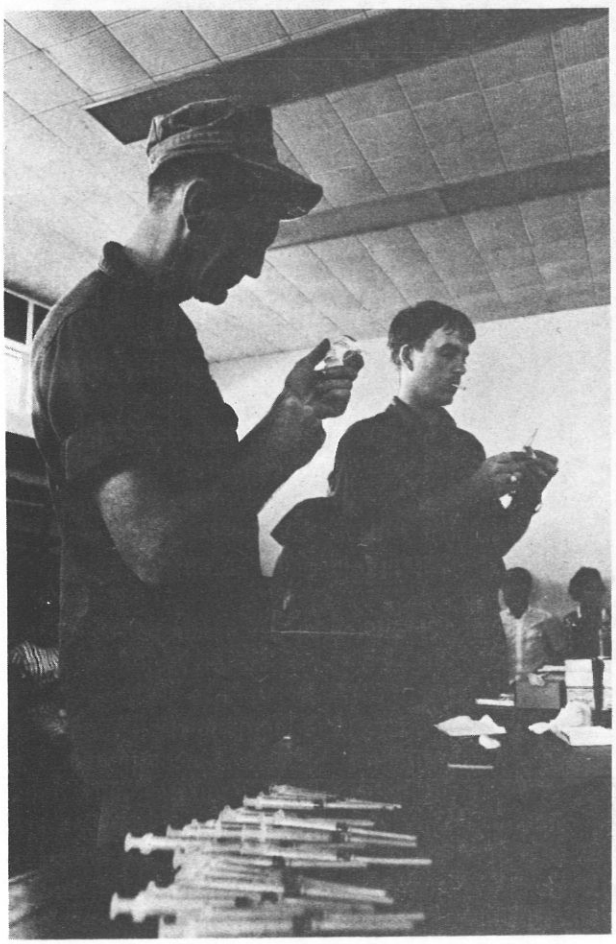
Medical centers were soon set up in schoolhouses and civic centers. Flashlights served as examining lights in the absence of electrical power.

Due to a lack of sanitation facilities, several cases of typhoid and cholera were reported. Combined immunizations were administered by the corpsmen.

Some of the villagers who required medical aid but could not get to the medical centers due to road conditions, were ferried by helos. It was the first time many of them had flown in a helicopter or even been inside an aircraft. The 15-minute flight provided a welcome diversion from the ravages of the disaster.

Helos could not efficiently distribute the necessary foodstuffs and carry patients to the medical centers at the same time. A Philippine Air Force doctor and seven corpsmen were flown into a remote area 40 miles inland in order to assist victims in that isolated location. Out of a total population of approximately



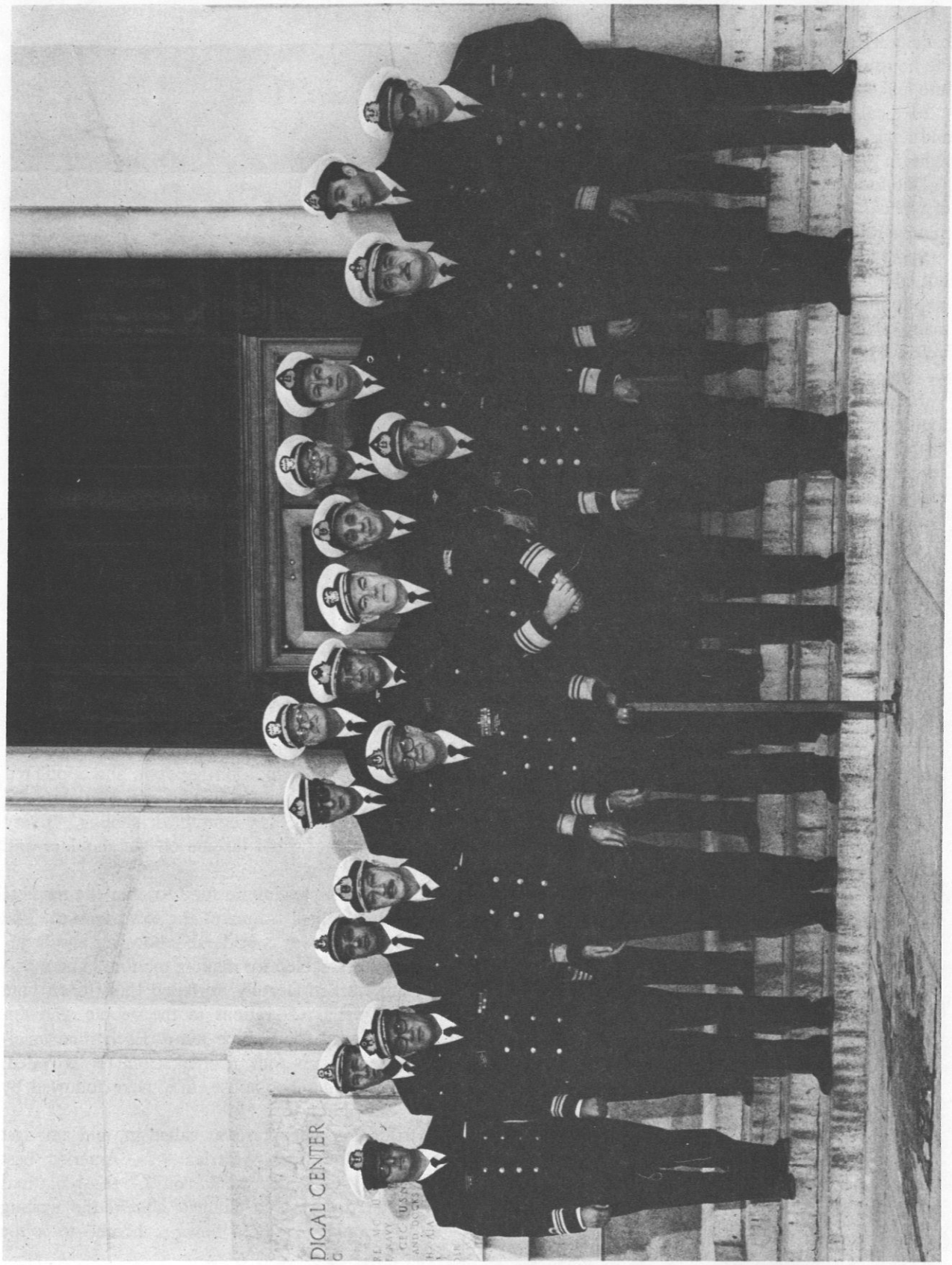


30,000, the seven-man team immunized around 1300 people (cholera and typhoid) and treated about 800 injured. A few respiratory diseases were also treated.

"By noon," reported Hospitalman Allan Sherman, "we were completely set up and in full operation. The second person I treated was a 12-year-old girl. As soon as I had bandaged her foot, she appointed herself my official interpreter and guardian angel—I needed both." Sherman continued, smiling, "Every few minutes she would tap me on the shoulder and give me a big grin."

The villagers, having no food to offer the medical team, offered them a tour of the town instead. The volume of work was considerable however and insufficient time remained for making the tour. The medical team worked steadily, forfeited their lunch time and gave their "C" rations to the people who appeared to need food much more. Each time medical team members took a break from the crowded, hot and humid schoolhouse, they were followed by scores of children.

At dusk, a helicopter was called in, and amongst cries of "God bless America . . . America best country in the world, thank you!!!," the hot, tired but gratified corpsmen climbed aboard the waiting "birds" and were flown home—to the OKINAWA.


DICAL CENTER

HIGHLIGHTS OF THE SIXTH CONFERENCE OF THE SURGEONS GENERAL OF THE NAVIES OF THE AMERICAS

Hosted by VADM G. M. Davis, MC, USN, Surgeon General, daily sessions of the Sixth Conference were held in the Pan American Health Organization Headquarters (P.A.H.O.) at 23rd and E Street, N.W. in Washington, D.C. from 23–27 November 1970. On 28 November, the delegates visited the National Naval Medical Center in Bethesda, Md. Following a welcome and briefing by RADM F. O. Ballenger, Commanding Officer, a tour of selected commands and clinical facilities was conducted with Staff Guides and Translators in attendance.

Conference Organization

Assisting the Surgeon General and Deputy Surgeon General RADM J. W. Albrittain, MC, USN, were the Secretariat General and Program Collaborators. Dr. Abraham Horwitz, Director of the Pan American Health Organization, and his staff, contributed greatly to the success of the meeting by their gracious hospitality and active participation.

Secretariat General to the Sixth Conference:

Secretary General—RADM H. S. Etter, MC, USN
Deputy Secretary—CAPT N. B. Curtis, MSC, USN
Assistant Secretary—CAPT J. E. Wilson, MC, USN
Executive Secretary—CDR E. N. Buckley, MSC, USN

Program Collaborators:

RADM F. O. Ballenger, MC, USN, CO, National Naval Medical Center
CAPT D. L. Custis, MC, USN, CO, Naval Hospital, Bethesda
CAPT C. L. Waite, MC, USN, CO, Naval Medical School, Bethesda
CAPT R. Stevenson, MC, USN, Senior Medical Officer, Naval Academy, Annapolis, Md.

Delegations

Argentina

RADM Jose Antonio Isola, MC, Argentine Navy, Surgeon General
CAPT Raul Charles Leon, MC, Argentine Navy
LCDR Francisco A. Juarez, MC, Argentine Navy

Brazil

VADM Geraldo Barroso, MC, Brazilian Navy, Surgeon General
CDR Manoel Varela, MC, Brazilian Navy
LT Erany Jose Da Silva, Pharmacist, Brazilian Navy

Chile

RADM Miguel Versin Castellón, MC, Chilean Navy, Surgeon General
LCDR Jorge Cariola Sutter, MC, Chilean Navy
LCDR Norman McCawley Matthers, MC, Chilean Navy

Colombia

CDR Alvaro Gomez Diaz, MC, Colombian Navy, Surgeon General
LCDR Jaime Fandino Franke, MC, Colombian Navy

Peru

RADM Jose Lozano Pardo, MC, Peruvian Navy
Scientific Attaché, Embassy of Peru

Venezuela

CAPT Elpidio Serra Gonzalez, MC, Venezuelan Navy, Surgeon General
CAPT Santiago Hernandez, MC, Venezuelan Navy
LT Joel Pirela Enriquez, MC, Venezuelan Navy

Note: The conference was further enhanced by the presence of Surgeon Captain J. A. B. Cotsell, MC, Royal Australian Navy. Surgeon Captain Cotsell was engaged in making an extended tour of U.S. Navy and other military medical facilities prior to assuming the post of Surgeon General of the Australian Navy.

Opening Session

Situated in the splendid facilities of the Pan American Health Organization building where each chair is equipped with headphones that provided immediate translations into English, Spanish and Portuguese, CAPT Curtis opened the meeting.

RADM W. L. Small, USN expressed greetings for ADM E. Zumwalt, CNO, who was unable to attend. RADM Small traced the development of inter-American naval meetings of specialized groups which originated with the conference of Naval Academy Superintendents at Annapolis, Md. in 1961. The Naval Surgeons General first met in Washington, D.C. in 1962. Among the benefits resulting from such collaboration, ADM Small noted, is the standardization of nomenclature, so necessary in effective provision of medical relief at times of international disasters.

A warm welcome address was delivered by Dr. Horwitz, P.A.H.O. Director.

VADM Davis, the host Surgeon General, set the tempo for the congenial professional meetings to follow by crystallizing broad concepts of health care systems and posing several penetrating questions:

"Are we fragmenting our resources too much when we might combine them for a large, more efficient and less expensive operation?

"Can unusually costly equipment or clinic facilities be better shared rather than duplicated?

"Are we extending our resources beyond our capabilities and, if so, how do we balance them and still provide the needed care for our people?

"Are we really patient care oriented or are we management care oriented, and which should we be?"

Brief opening remarks by each visiting Surgeon General or his designee followed. RADM Isola of Argentina noted financial restrictions, reorientation of views through social consciousness, integration of data computing system with the general staff, and improvement in retaining naval physicians (50% integration with better than 90% retention). VADM Barroso of Brazil expressed optimism for the future through implementation of a master plan to insure sufficient medical resources. RADM Castellón of Chile congratulated the U.S. Navy Medical Dept. for having had the wisdom and foresight to initiate these meetings in which Chile is pleased to participate. CDR Gomez Diaz of Colombia mentioned their need for longer permanence of career personnel and spoke

of closer contact with the civilian population with increased naval public health services. RADM Lazano Pardo of Peru commented on the high value of the Surgeons General Conference and alluded to radical changes now occurring in his country, to be later discussed in depth. VADM Davis suggested exploring a better means of cohesion and communication among the countries during the off-year meetings. CAPT Gonzalez of Venezuela outlined a naval health service program with personnel entering in specialist or nonspecialist categories.

The Honorable John H. Chafee, Secretary of the Navy, took time out from his busy schedule to address the Conference. Confining his pertinent remarks to a few moments, which was appreciated after a full day of presentations, the Secretary then passed among the delegates to extend to each of them his personal greetings.

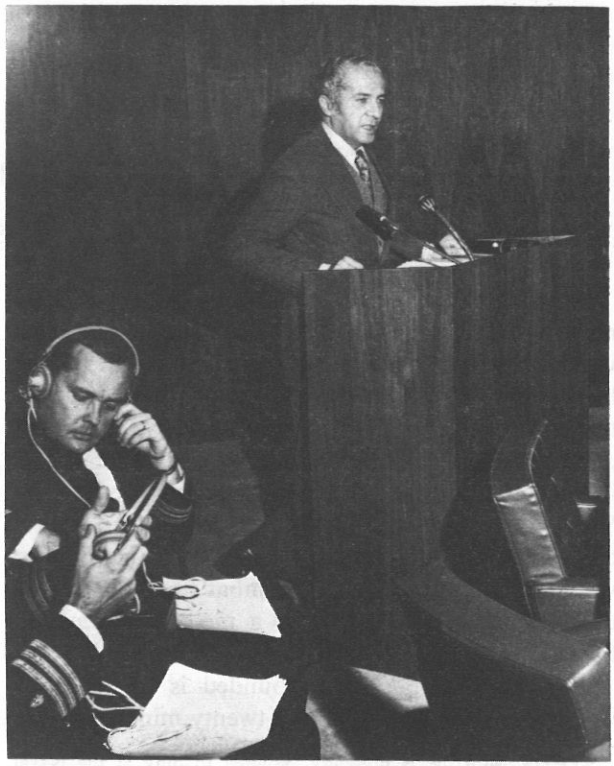
Participants

The Navy Medical Support Role:
Medical Support to the Operating Forces by CAPT J. H. Stover, Jr., MC, USN
Whole Blood Support in Military Operations and Disasters
by CAPT T. H. Conaway, Jr., MSC, USN
In Community Action
by CAPT C. H. Miller, MC, USN

In Epidemics
by CDR R. D. Comer, MC, USN
In Disasters
by CAPT G. W. Werner, MSC, USN
In Peacetime and Disasters
by VADM G. Barroso, MC, Brazil

Neuropsychiatry and Mental Health in the Uniformed Services:
Organization of a Mental Health Center
by RADM J. A. Isola, MC, Argentina
Psychoneurosis—Armed Services
by CAPT R. Leon, MC, Argentina
Psychologic Study of the Military Group
by RADM Isola, MC, Argentina
Strategies in Preventive Psychiatry
by LCDR P. D. Nelson, MC, USN
Neuropsychiatric Aspect of OPERATION DEEP FREEZE
by CDR R. E. Strange, MC, USN
Mental Health Problems in Latin America
by Dr. Rene Gonzalez, Regional Advisor in Mental Health, P.A.H.O., WHO
Alcoholism and Rehabilitation
by CDR M. Varela, MC, Brazil
Alcoholism and Its Prevention
by RADM M. V. Castellón, MC, Chile
Panel Discussion Moderator: RADM Isola

Medical Research by the Brazilian Navy
by VADM G. Barroso, MC, Brazil
Clinical Uses of the Frozen Red Blood Cell
by CAPT C. E. Brodine, MC, USN
Photographic Endoscopy in the Diagnosis of Gastric Pathology
by LT J. P. Enriquez, MC, Venezuela
Endoprosthesis of the Elbow
by CAPT E. S. Gonzalez, MC, Venezuela
Oral Surgery in the Treatment of Maxillofacial Injuries
by CAPT E. W. Small, DC, USN, and CDR W. C. Terry, DC, USN
Man-Environment Relationships
by Dr. Mark Hollis, CE, DSc; Chief, Department of Engineering and Environmental Sciences, P.A.H.O., WHO



Use of Pesticides and Rodenticides in the Venezuelan Navy
by CAPT E. S. Gonzalez, MC, Venezuela
Kidney Transplants Performed in the Valparaiso Naval Hospital
by LCDR J. C. Sutter, MC, Chile

Procurement and Retention of Medical Department Personnel:
Action of the General Staff of the Armed Forces in Recruitment and Incentives for Entry Into the Medical Corps
by E. J. Da Silva, Pharmacist, Brazil
MEDHIC—Assimilation of Former Naval Paramedical Personnel Into Civilian Health Care Fields
by CAPT H. G. Edrington, MSC, USN
The U.S. Navy Medical Corps—Present and Future Plans
by CAPT R. K. Barton, MC, USN
Panel Discussion Moderator: CAPT Barton

CDR James J. Verunac, DC, USN, Dental Officer, USS PROTEUS (AS-19), presented a slide and lecture description of "A One-Appointment Technique for Root Canal Treatment" as the 6th Annual Asian-Pacific Dental Congress in Bangkok, Thailand. The Dental Congress met 18-22 November 1970 and was well attended by dentists from all over the world.

THE AMPUTEE FROM BATTLEFIELD TO HOME

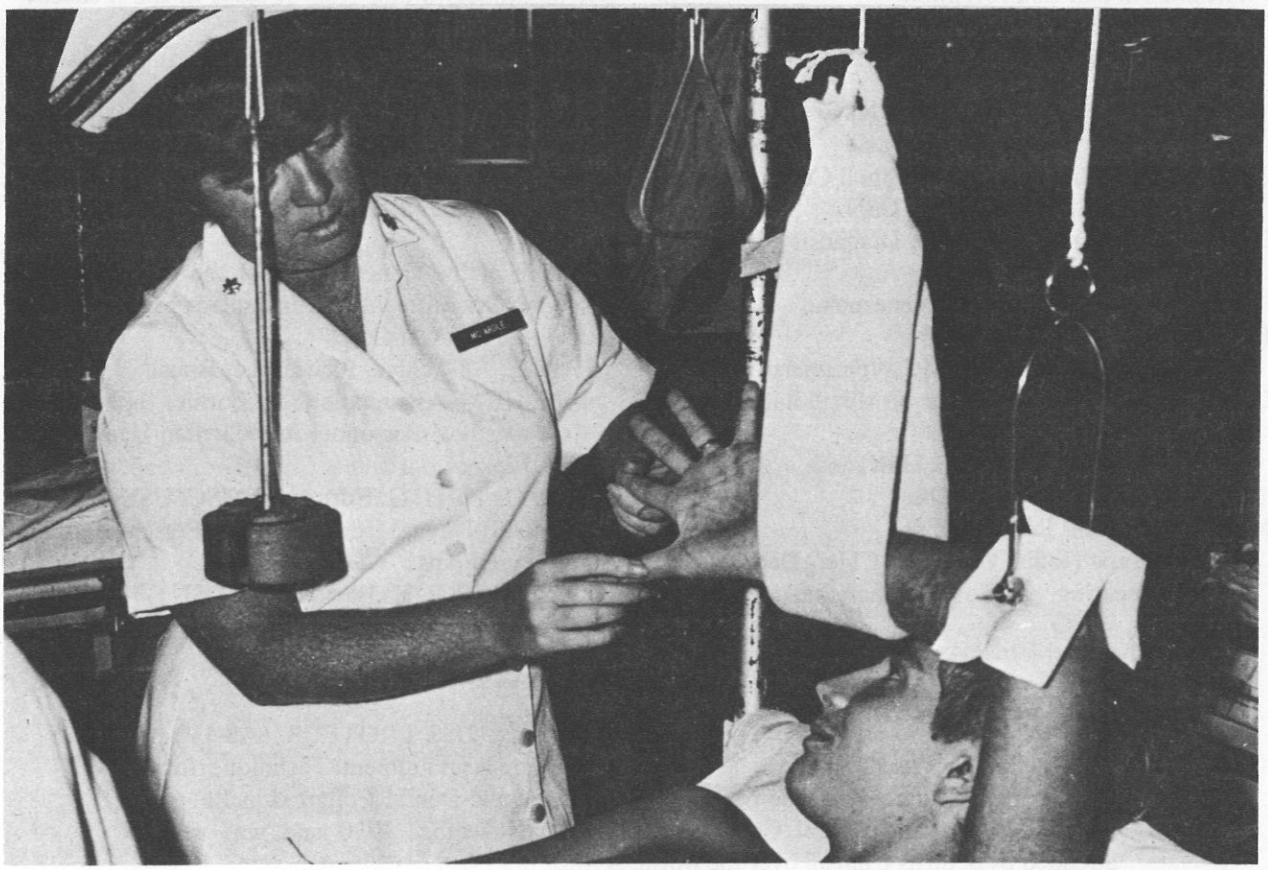
By LCDR Mary Cecilia McArdle, NC, USNR, U.S. Naval Hospital, Guam, M. I.*

At no previous time in history has the military nurse been so exposed to the complex care of such vast numbers of amputees. Medical techniques have been improved in the interest of expediency, quantity, and quality of care. Such advances in treatment can be applied not only in military services, but also in civilian medicine and nursing. Emphasized by the Vietnam conflict, the institution of the helicopter evacuation service has extended life to many who would have died in previous combat situations before they could be transported to a medical evacuation hospital.

Immediate care of the wounded is rendered by well trained corpsmen. Within twenty minutes to one hour of the initial injury, the patient is received by a medical facility staffed with specialists to commence definitive treatment. Shortly after arrival the patient will be transported to an operating room for appropriate procedures to sustain his life.

Highly specialized nursing care is initiated at a medical support activity or in a hospital ship, and intermediary care continues at Naval Hospitals—Guam, Mariana Islands, or Yokosuka, Japan. Patient care at these facilities includes débridement of all wounds, exploration of wounds, frequent partial wound closures, and occasionally complete closure at the site of an amputation. Morale is usually high when patients reach any of these units because they see it as "a step toward home".

* LCDR McArdle is presently assigned to duty at the Naval Hospital in USS Sanctuary.



The nurse must apply all the principles of basic nursing, yet be able to determine individual needs and plan specific care for each patient. Ideally, the amputees are placed in close proximity to each other on the ward. The nurse must be alert to detect evidence of complications including hemorrhage, shock, fat embolism, infection, pulmonary embolism, and pneumonia. Open wounds are carefully dressed using two team members, an essential procedure in maintaining aseptic technique. Following dressing changes, a figure-of-eight dressing is applied with slight, evenly graded pressure to the stump, thereby reducing edema, preventing a bulbous formation, and preparing the extremity for later prosthetic fitting.

Prevention of contractures is of primary importance. As soon as possible after injury, the patient should be engaged in active and passive exercises of all extremities including the involved area to maintain good muscle tone and strength. These exercises are normally instituted while the patient is still at bed rest. Adequate maintenance range of motion can be accomplished with the patient in the supine position and should include the following motions:

1. Shoulder—flexion, abduction, adduction, internal rotation, external rotation
2. Elbow—flexion, extension
3. Wrist—flexion and extension, ulnar and radial deviation
4. Hand—flexion, extension, thumb mobilization
5. Hip—flexion, abduction, internal rotation, external rotation, adduction, extension
6. Knee—flexion, extension
7. Ankle—dorsiflexion, plantar flexion, inversion, eversion.

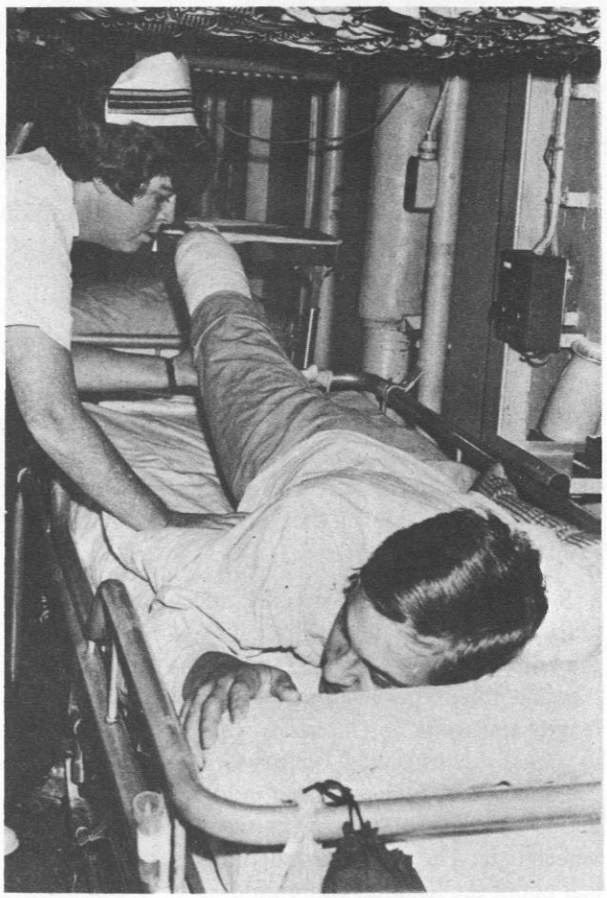
Properly trained personnel encourage the patient to sleep on his abdomen. Patients in traction may also assume this position by moving the traction unit to the opposite side of the bed thereby maintaining proper body alignment.

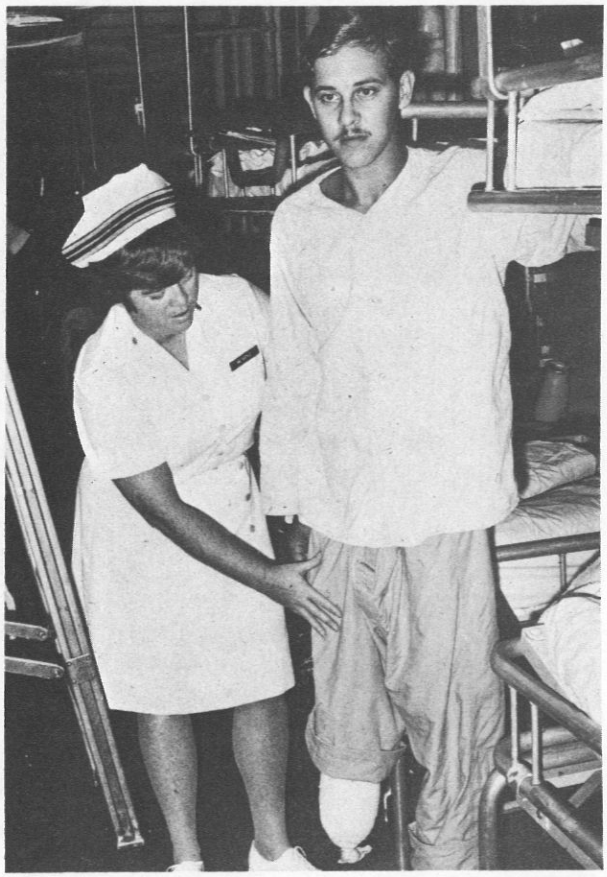
Skin traction is occasionally necessary when primary closures are delayed because of infection or if the bone has been severed at the same level or below the skin line. This method of treatment retains skin length and need not interfere with wheelchair activity. Easily constructed boards with an extension to accommodate pulleys, rope and weights, can be added to the seat of any conventional light-weight wheelchair. The patient is encouraged to wheel himself about the hospital compound.

Elevation of the lower extremities is rarely ordered unless the patient is immediately postoperative, and then only for a period of 24 hours to prevent edema and reduce bleeding. If hip contractures are permitted to develop, they will later interfere with ambulation. The patient may require more extensive physiotherapy or further surgical procedures to release the contractures.

In the absence of other injuries, the patient can be prepared for walking within a few days to a week after amputation. He should practice balance on the ward using any stable fixture. A bedside locker may serve the purpose. The body should be in correct anatomical alignment without flexion or abduction of the stump. A well motivated patient will usually achieve an excellent position by the time he is ready for prosthetic work. This usually occurs two to three months post injury.

Continuity of care is offered at two naval facilities, Naval Hospital, Philadelphia, Pa.; or Naval Hospital, Oakland, Calif., whichever is closer to the patient's home. Here the orthopedic team prepares the patient to return to civilian life, or in some cases





to active duty. Dressings are continued until infections heal, wounds are closed, and stump revisions completed, if necessary.

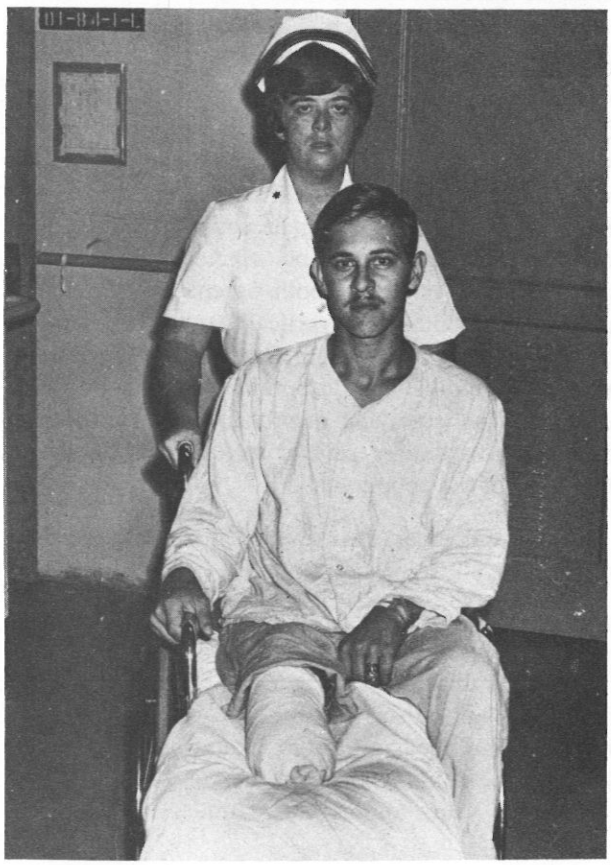
As the wound heals, compression dressings are continued to mold the stump into a conical shape necessary for proper fitting of a prosthesis. The figure-of-eight wrapping is stressed. The bandage is an elastic type and must be extended well above the joint with the leg in extension when applied. Stump hygiene is essential, and the patient is taught to cleanse the area daily with warm water and soap followed by thorough drying and exposure to air. During this procedure, the stump should be checked for abrasions and signs of infection. Ordinarily the patient should be taught at this point to properly wrap his stump.

The patient with a suddenly acquired physical handicap is more prone to develop psychological shock than a patient who has been psychologically prepared for elective surgical amputation. We are basically dealing with young men who went to war not personally expecting to return handicapped. Feelings of denial, depression, mutilation, and demasculinization can easily be detected by the nurse. An alert nurse is in a position to offer reassurance and

encouragement so necessary during this period of time. Her approach should be firm but sympathetic. Enforcing ward regulations is essential and the patient should not be allowed to go beyond the limits set for him. The hospital ill serves a patient by repeatedly making allowances which society will not endure.

Before discipline becomes an overwhelming problem, it might be helpful to initiate group sessions on the ward. Ideally, the group should consist of the ward medical officer, psychiatrist, chaplain, nurse, corpsmen, and patients. The staff should not exceed the patients in number or they will feel threatened and be reluctant to discuss their problems. A permissive atmosphere should be created where the patients feel free to ventilate their feelings of concern; yet, the situation, to be therapeutic, must be contained within a controlled setting. Patients frequently discuss difficulties in acceptance by their family members, adjustment to society, and future goals. Each member of the group offers possible solutions to the problems being discussed. This method has been used successfully at the Naval Hospital in Philadelphia.

The most crucial moment is reached when the patient receives his family on their first visit for he often ponders whether or not he will be accepted. A wise nurse will confer with the family prior to their first visit and make herself available for future visits.



Continuous efforts are being made to rehabilitate the amputee to return to his family, job, or active duty. The Veterans Administration provides training programs for eligible military personnel who become disabled as a result of injuries acquired during active duty service. Arrangements for participation in these programs are frequently made for the patient prior to discharge from the hospital. The types of training offered include trade school, technical school, college or university programs, on-the-job training, or a combination of school and job training. Financial assistance is also offered by the Veterans Administration in many instances. At the Naval Hospital in Philadelphia, a postal training course is offered, and many of the amputees take advantage of this program. A counselor is available to help the men develop realistic educational and vocational plans.

The amputee is often eligible for additional grants from the Veterans Administration to construct or remodel a home designed for the needs of a handicapped individual. Payments toward the purchase of specially built automobiles may be authorized.

Other services offered to the amputee include Civil Service preference, reemployment rights and unemployment compensation. Military nurses should be familiar with the rehabilitation programs and encourage the patients to seek appropriate assistance to take advantage of these services.

Recently, the Marine Corps described, in Change Four to the Separation and Retirement Manual, circumstances in which amputees can remain on active duty if they so desire. For example, it may be possible for a Marine to be retained on active duty in a limited duty status filling a Non-Fleet Marine Forces billet if he has sustained the loss of the minor hand or if he has a below-the-knee amputation, provided a satisfactory functional prosthesis is worn.

The military nurse shares her patients' deep pride and personal satisfaction when she sees them able to "walk" proudly once again. This goal is being realized with increasing frequency through the coordinated effort of patients, medical and paramedical personnel.

REFERENCES

1. Haacker, Lee P., LCDR, MC, USNR, "Time and Its Effects on Casualties in World War II and Vietnam." *Navy Medical Newsletter,* Vol. 54, No. 2, August 1969.
2. "Marine Corps Gives Amputee Rules; Who Stays, Fast Releases." *Navy Times,* 22 February 1970.
3. McClendon, F. O., CDR, MC, USN, "From the Annals of Naval Support Activity, DaNang, Republic of Vietnam." *Navy Medical Newsletter,* Vol. 55, No. 3, March 1970.
4. Larson, Carrol B. and Gould, Marjorie, *Caldewood's Orthopedic Nursing,* 6th ed., C. V. Mosby Company, pp 339-361.
5. Orthopedic Nursing Course, Lecture Material, Naval Hospital, Philadelphia, Pa.
6. The Veterans Administration. "Vocational Rehabilitation and Orthopedic Benefits for Persons Disabled in Military Service." *Veterans Administration Pamphlet* 26-61-1 (Revised).

(*Continued from page 25*)

the families studied. However, a forme fruste is suggested by one person with heterochromia of the irises, an abnormality reported with neurofibromatosis. In addition, the case with disseminated basosquamous carcinoma of the skin raises the possibility of an underlying condition predisposing to rhabdomyosarcoma and multiple skin cancers, such as the basal cell nevus syndrome. None of the congenital defects that occurred in a recently reported series of children with soft-tissue sarcomas were found in these families.

The familial aggregation of these tumors cannot be explained by chance occurrence, since similar surveys conducted on a variety of other childhood neoplasms uncovered no instances in which a sib and parent of the proband were reported to have neoplasms. An inherited predisposition for these tumors appears likely, although it is premature to assign a precise genetic mechanism. However, the pattern of involvement in these four families is compatible with transmission by a pleiotropic autosomal-dominant gene, with its expressivity limited by age and sex variations and by other modifying influences (environmental and genetic). A similar mechanism has been postulated for two other familial disorders of multiple neoplasms—pheochromocytoma with medullary thyroid carcinoma and primary adenocarcinomas, especially of the colon and endometrium.

An environmental influence for the familial concentration of tumors should be considered, especially since viruses are causal agents for rhabdomyosarcoma, breast cancer, and other tumors in inbred strains of animals. Since one child with soft-tissue sarcoma in each family died before the other was born, an environmental agent could not have been directly transmitted between affected children. The occurrence of cancer in both parent and child suggests the possibility of "vertical" transmission of an oncogenic agent between generations of *genetically susceptible* individuals. Laboratory studies are being conducted on surviving members of the families in an effort to evaluate genetic factors and viruses in the cause of the neoplasms.

(The references may be seen in the original article.)

DENTAL SCHOLARSHIPS—A Dental Student Scholarship Program has been approved, to commence in FY 1972. Thirty students will be selected for first-year dental-school education, followed by 30 more in each succeeding year to a total of 120 under instruction at any one time. Students will be commissioned in the Navy Reserve and each student will be obligated to serve 5 years for his 4-year underwritten school expenses.

To the Editor: Since there has been some dispute in the cover photo of July '70 Navy Medical Newsletter, I feel obligated to CAPT Brown, MC, and all readers to try and explain the picture.

The scene is the helicopter deck USS Sanctuary (AH–17) where I have just spent one year. In some 4,500 helo-landings with either casualties aboard or whatever, there was never a litter carried backwards. What you are seeing is a Med-a-vac. The man is being transferred from the ship to the helo for either an In-Country or CONUS hospital.

BM2 G. A. Cameron, USN
Landing Safety Enlisted
USS Observation Island (AG–154)
FPO, N.Y. 09501

To the Editor: Reference letter by CAPT J. V. Brown, MC, and accompanying defense of the photograph picturing litter bearers aboard the SANCTUARY, in your October 1970 edition.

I realize that CAPT Brown's comment concerning litter unloading was meant as a pun, however, I must add to the defense of the crewmen of both REPOSE and SANCTUARY on their excellence in unloading and treating casualties. As former Commander of the U.S. Army 571st Medical Detachment (Helicopter Ambulance) (DUSTOFF) located at Phu Bai/Hue, from February through November 1968, I can certainly attest to the efficiency and dedication displayed by these men, having been one of their prime customers. It was during this period that REPOSE set the phenomenal one month admittance record of 953. The untiring, almost continuous receipt and unloading of my unit's aircraft was unexcelled. What was most gratifying, was the crew's attitude of helpfulness during all hours of the day and night, in all kinds of weather. I feel a special attachment to all these fine men, since my unit was singularly honored in making the 5,000th (SANCTUARY), 7,000th and 8,000th (REPOSE) accident-free landings.

The rapport established between the crews of SANCTUARY and REPOSE and my unit was a tribute to the spirit of cooperation existing between Army and Navy during the combat situation. Thank you—REPOSE and SANCTUARY.

Major V. J. Cedola, MSC
U.S. Army Hospital, Bremerhaven
APO New York 09069

To the Editor: During my tour in SANCTUARY I was assigned as Division Chief Petty Officer of the Nursing Division. My duties included supervision of transfer of patients from helicopter to triage and evacuation of patients upon completion of treatment. The photograph on the cover of July '70 issue U.S. Navy Medicine (printed again in answer to CAPT Brown's letter in October 1970 issue) is one of evacuation of patients. Patients being carried from the wards to helicopters are placed on litters made up with blanket, sheets, pillows, etc. Patients being brought aboard by helicopter were not afforded the luxury of a completely made up litter. Also you will note that the forward litter-bearer is grasping the

(*Continued on page 45*)

RIGHT OVARIAN VEIN SYNDROME

REPORT OF THREE CASES

By LCDR Donald R. Tredway, MC, USN and CDR Richard E. Akers, MC, USN

Abstract

A discussion of the pathogenesis, diagnosis and management of the right ovarian vein syndrome is presented. Treatment is dependent upon the degree of obstruction, the presence of urinary tract infection and the gestational age of the patient. Three case reports are discussed, each representing different facets of the entity. The right ovarian vein syndrome may help to explain the right pyelonephritis, the right hydronephrosis, and the right hydroureter of pregnancy.

From the Department of Obstetrics and Gynecology and Urology, Naval Hospital, Portsmouth, Virginia 23708.

Presented in part at the Ninth Annual Meeting of the Armed Forces District, The American College of Obstetricians and Gynecologists, Las Vegas, Nevada, Oct. 19-23, 1970.

Acknowledgement: We are grateful to CAPT R. Baker and CDR M. S. Baggish for their assistance in the preparation of this paper.

The right ovarian vein syndrome of pregnancy was originally reported by Clark[3] in 1964. The syndrome was described as a venous obstruction of the right ureter due to an aberrant ovarian vein. The latter vessel caused no difficulty until it enlarged during pregnancy resulting in right ureteral obstruction at the level of the first sacral vertebra (S–1). Many cases are probably not recognized during pregnancy. Thus to afford a greater awareness of the syndrome, three cases are presented which illustrate the various facets of the entity.

Clinical Material

CASE 1. A 22-year-old caucasian female primigravida was admitted at 30 weeks' gestation with fever, chills, nausea, vomiting, and abdominal tenderness. The patient had been taking Furadantin for

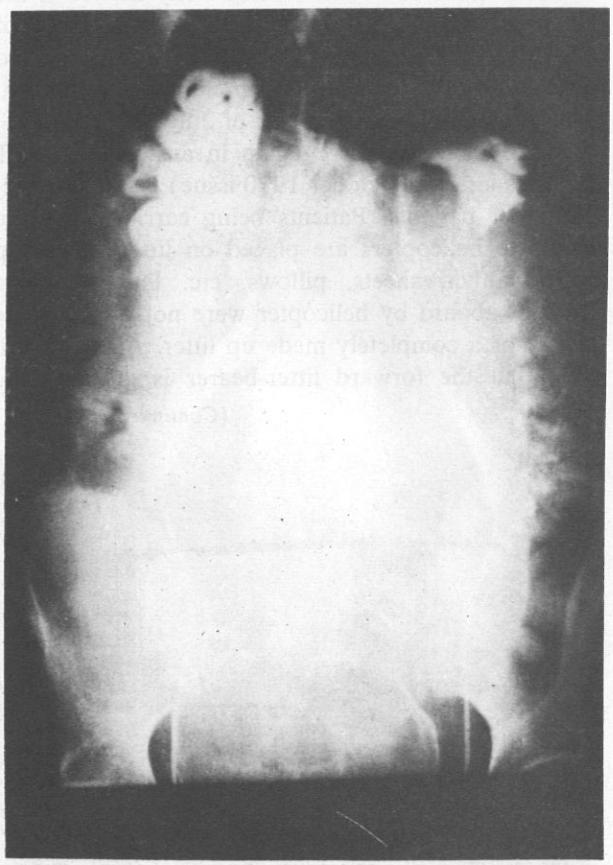


Fig. 1a. (Case 1)—Retrograde IVP at 30 weeks' gestation.

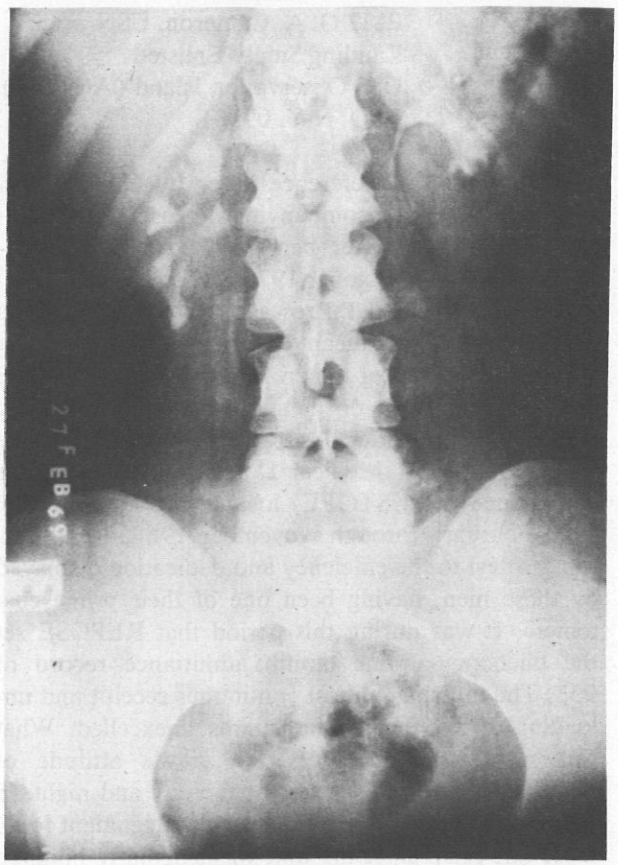


Fig. 1b. (Case 1)—IVP six weeks postpartum before ligation.

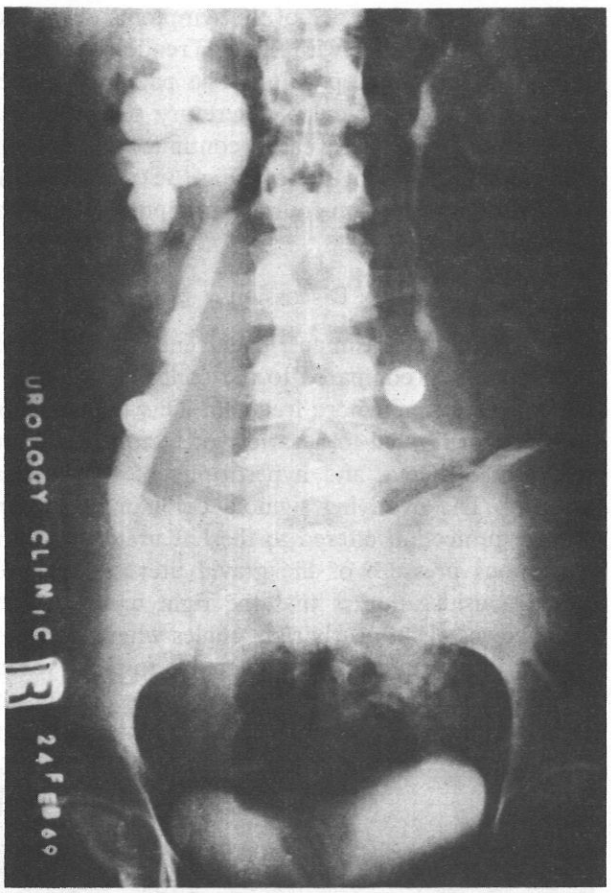


Fig. 2a. (Case 2)—IVP before ligation at 24 weeks' gestation.

one week for a Klebsiella-Aerobacter urinary tract infection. Physical examination revealed a temperature of 103°F, vague right lower quadrant tenderness, and right costovertebral tenderness. Microscopic examination of the urine revealed packed white blood cells. The patient was started on parenteral fluids and ampicillin. She continued to run a febrile course and after 48 hours kanamycin was added to the regimen. The admission urine culture revealed Klebsiella-Aerobacter resistant to ampicillin. Therefore, cephaloridine was substituted for ampicillin. A double dose excretory urogram revealed no visualization of the right kidney. The blood urea nitrogen (BUN) was 25 mg./100 ml. A retrograde pyelogram revealed a right hydronephrosis and hydroureter to the level of S–1 (Fig. 1a). Purulent drainage was obtained from the right ureter. Following the procedure, the patient became afebrile in two hours. The BUN was 8 mg./100 ml. in 12 hours. Right ureteral drainage via a catheter was continued for 11 days. After discharge the patient was continued on Furadantin and delivered a normal infant spontaneously at 36 weeks' gestation. Excretory urogram six weeks postpartum revealed partial atrophy and changes compatible with pyelonephritis scarring of the right kidney (Fig. 1b). Twelve weeks postpartum an enlarged aberrant right ovarian vein was electively ligated to prevent recurrence with further kidney damage.

CASE 2. A 22-year-old caucasian female secundigravida (previous caesarean section for cephalopelvic disproportion) was initially admitted at 24 weeks' gestation with possible hematemesis. The patient became febrile and developed right lower quadrant tenderness, colicky pain, and right costovertebral tenderness. Numerous white blood cells were noted microscopically on urinalysis. On excretory urogram the two-hour delayed film revealed a right hydronephrosis and hydroureter with blockage at the level of S–1 (Fig. 2a). The patient was treated with parenteral fluids, antibiotics, and complete bedrest in a left lateral decubitus, slight Trendelenburg position. Since the patient did not improve with conservative therapy, at 26 weeks' gestation a ligation of an aberrant, obstructing right ovarian vein was accomplished

Fig. 2b. (Case 2)—IVP five days after ligation.

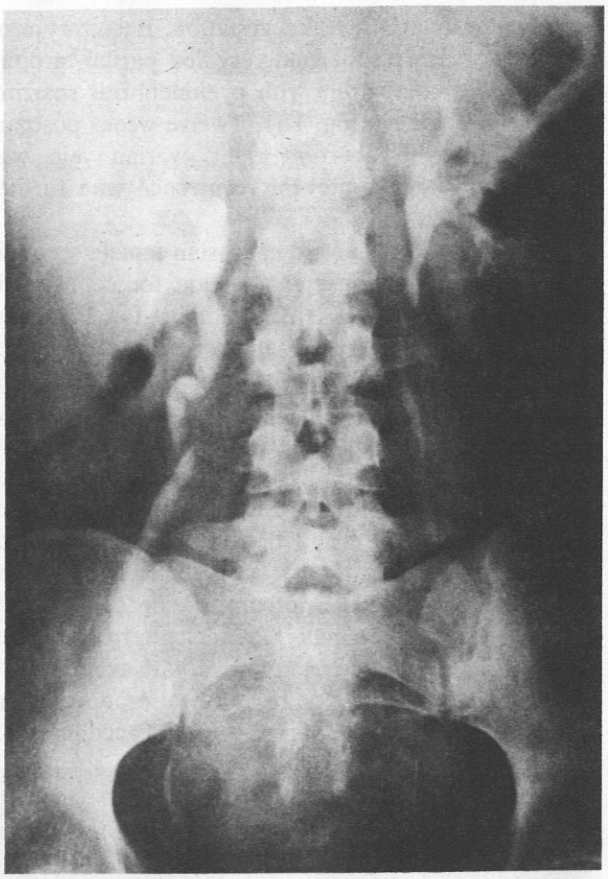


Fig. 2c. (Case 2)—IVP 17 days after delivery.

through an extraperitoneal approach. The patient did well and was continued on antibiotics. Excretory urogram five days postoperative revealed some improvement (Fig. 2b). A full term infant was delivered via repeat caesarean section at 40 weeks' gestation. The right ovarian vein was noted to be remarkably smaller than the other pelvic veins. Excretory urogram 17 days after delivery was considered to be within normal limits for that period postpartum (Fig. 2c).

CASE 3. A 25-year-old caucasian female gravida III, Para 2 was initially admitted at 30 weeks' gestation with right flank pain, frequency, nausea, and vomiting. The patient was afebrile with no evidence of pyelonephritis. An excretory urogram revealed some blockage of the left collecting system at the level of the fourth lumbar vertebra on the 15-minute film with no visualization of the right (Fig. 3a). On a 5-hour delay film an obstruction of the right ureter was noted at the level of S–1 (Fig. 3b). The patient improved with conservative treatment. The patient never demonstrated pyuria but was maintained on prophylactic Furadantin. During the course of the pregnancy recrudescence of the symptoms always responded to bed rest with slight Trendelenburg and left lateral decubitus position. The patient delivered at term without difficulty. Excretory urogram four days after delivery revealed continued partial obstruction of the right ureter (Fig. 3c), however an intravenous pyelogram four months postpartum was normal (Fig. 3d).

Discussion

According to Eastman[6], occurrence of right ureteral dilatation compared to the contralateral side is two to three times more frequent. This phenomenon has been attributed to a variety of factors, including hypotonia, edema, and hypertrophy of the ureteral walls,[7,9]. The overlying sigmoid colon may account for the protection offered to the left ureter from the exogenous pressure of the gravid uterus. An additional consideration is that the right ureter crosses the iliac vessels at nearly right angles whereas the left ureter runs an almost parallel course to these vascular channels. Obstruction of the ureters also results from dilated ovarian veins. It is felt that the dilated

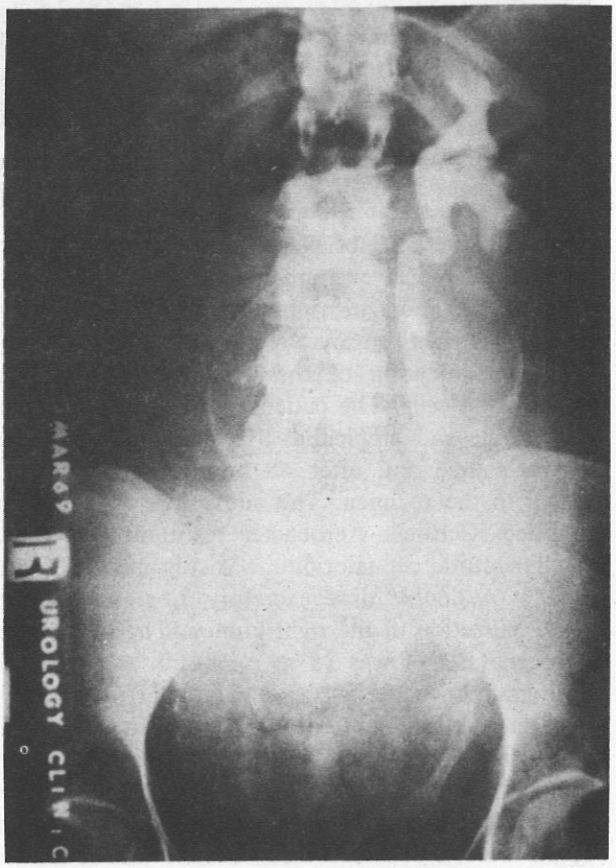


Fig. 3a. (Case 3)—15 minute IVP film at 30 weeks' gestation showing left hydroureter.

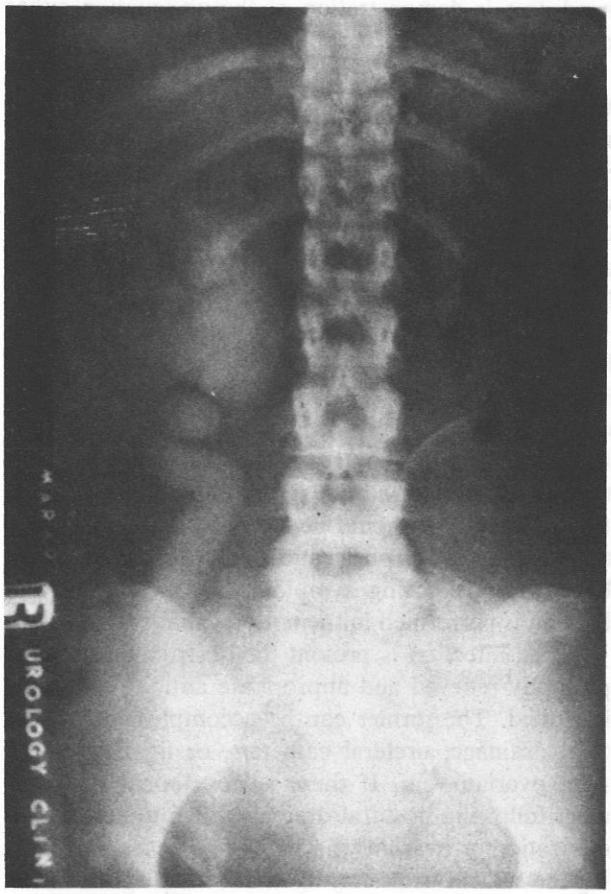


Fig. 3b. (Case 3)—Five-hour delay IVP film showing right hydroureter.

ovarian veins plus a combination of the above mentioned factors may account for the asymptomatic hydronephrosis and hydroureter of pregnancy. Similarly the aberrant right ovarian vein could explain the symptomatic right hydronephrosis and hydroureter of pregnancy. Most obstetricians are aware of these enlarged ovarian veins especially evident at the time of caesarean section. According to Derrick[5] the right ovarian vein syndrome is not prevalent with an incidence of 1 in 2,372 gestational females.

Embryologically in the development of the viscera, persistence of the posterior and subcardinal anastomotic branches results in aberrant forms of the right ovarian vein,[1,4]. As shown by pelvic venography,[2] the left ovarian vein empties into the vena cava via the left renal vein. Clinically the right ovarian vein shows numerous variations, however, standard anatomical texts do not illustrate these details[8]. Bellina[2] and Clark[3] describe the right ovarian vein draining into the vena cava at the third or fourth lumbar vertebra, while other variants may also empty into the right renal vein or branch both to the vena cava and right renal vein. Finally a plexus of veins may drain into the vena cava at levels as low as S–1. Venous plexuses of the right ovarian vein in the region of S–1 have been noted to encase the lower ureter, analogous to a vine around a limb[2]. Clark[3] believes that these aberrant veins explain the preponderance of right pyelonephritis, the symptomatic right hydronephrosis and hydroureter of pregnancy.

In comparison with normal urographic changes of pregnancy, the right ovarian vein syndrome presents a greater degree of hydronephrosis and hydroureter with obstruction at S–1. Hundley[10,11] demonstrated that a degree of hydronephrosis and hydroureter represent a physiological change noted during pregnancy. This "physiological obstruction" is usually more marked on the right with ureteral dilatation beginning at the pelvic brim. Resolution of these changes is usually complete 30 days post delivery.

Symptoms of ureteral compression may begin as early as the third month or as late as the eighth month of pregnancy. The majority occur in the fourth or fifth month of gestation. The severity of symptoms depends on whether urinary tract infection is present. With infection the clinical picture is that

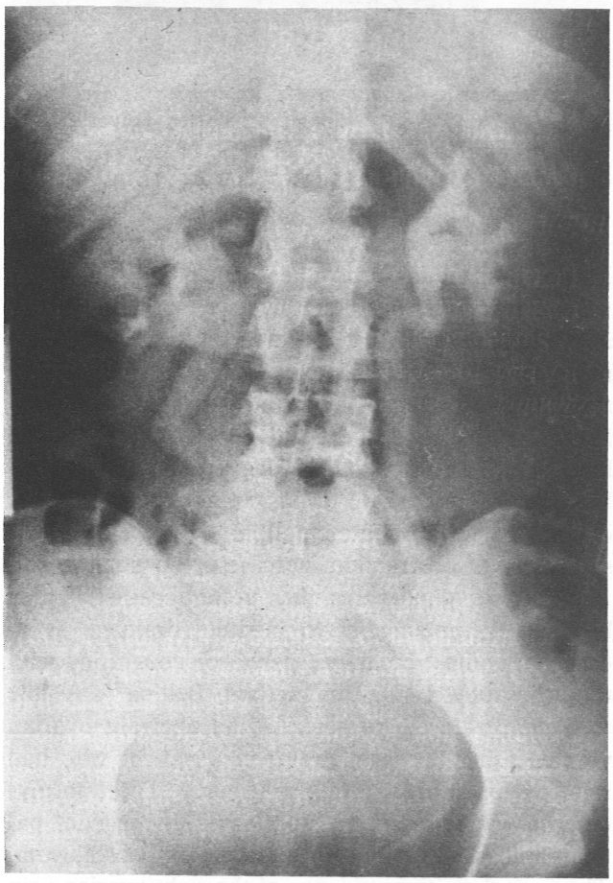


Fig. 3c. (Case 3)—IVP three days after delivery.

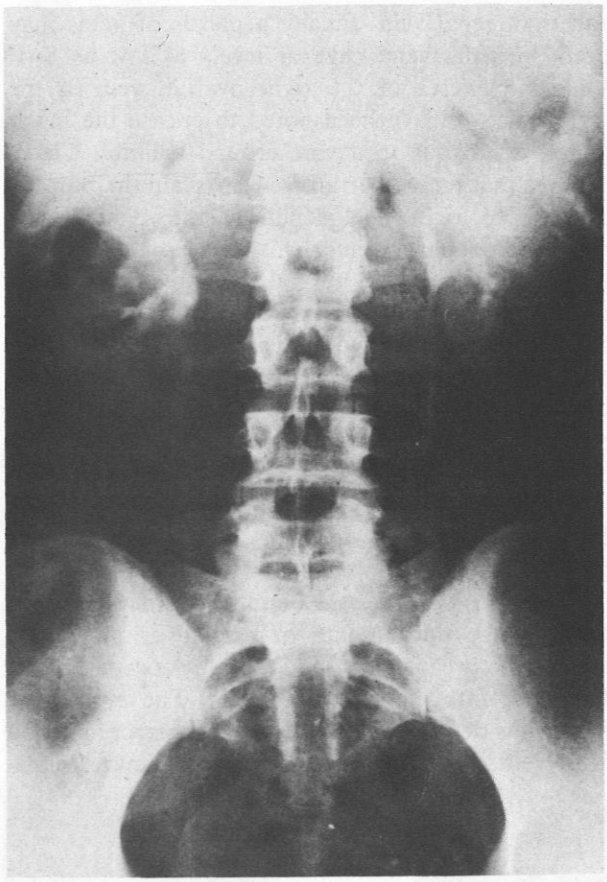


Fig. 3d. (Case 3)—IVP four months after delivery.

of acute pyelonephritis (cases 1 & 2). If infection is not present, the complaints include backache, tenderness of the costovertebral angle, and vague right lower quadrant discomfort (case 3).

Diagnosis can be made by excretory urography and when necessary retrograde pyelography. Care must be taken to avoid excessive irradiation to the fetus. The radiologic picture is that of marked right hydronephrosis and hydroureter with blockage at the level of S–1. If infection is not present, it is preferable to avoid retrograde pyelograms for fear of introducing bacterial contamination. However, if the symptoms of obstruction increase or do not respond to conservative measures, then ureteral catheters may be used therapeutically to institute drainage as in case 1. Pereira[12] combines pelvic phlebography with the urography. Using this method, Bellina[2] was able to demonstrate the presence of an aberrant ovarian vein encasing the right ureter in a patient who had right pyelonephritis during pregnancy. The transmyometrial venogram is not applicable to pregnant patients but is useful in follow-up studies postpartum. The most definitive evidence of the right ovarian vein syndrome is demonstration of the obstruction either at surgery or with urography and pelvic venography.

Since irradiation to the fetus may be harmful, its use must be restricted to a minimum. Eastman[6] notes that a single anterior-posterior film of an intravenous pyelogram contributes 600 milliroentgens to the fetus. Clark[3] used a high kilovolt technique, taking 15 and 30-minute films. He found no immediate fetal abnormalities but unfortunately did not have a long-term follow-up.

Treatment of the pregnant patient depends on the length of gestation and the presence or absence of infection (Table 1). When infection is not present, conservative management is carried out as described in case 3. The therapy consists of bed rest and positioning on the left side in slight Trendelenburg position. All patients should be followed closely postpartum. If the partial obstruction persists, as evidenced by chronic recurring symptoms, then ovarian vein ligation is performed in the nonpregnant state.

When infection is present the obstruction must be promptly relieved and appropriate antibiotic therapy instituted. The former can be accomplished by postural drainage, ureteral catheters, or ligation of the right ovarian vein. If there is no clinical improvement following postural drainage, then ureteral catheterization or ovarian vein ligation is necessary. During the second trimester, ligation of the right ovarian vein is performed through an extraperitoneal approach as was noted in case 2. In the third trimester, ureteral catheterization is utilized as was described in case 1. The preferential order of treatment is summarized in Table 1.

TABLE 1. Preferential Order of Treatment

Trimester	Infection *not present*	Infection *present*
II	A E	A B D
III	A E	A B C E

Legend:
A —Postural drainage and supportive care
B —Appropriate antibiotics
C—Ureteral catheterization
D —Surgical ligation during pregnancy
E —Postpartum surgical ligation if chronic symptoms persist

Clark[3] also noted that the resolution of the hydroureter and hydronephrosis postpartum required only five days after right ovarian vein ligation. The latter may be contrasted with the six to eight weeks required for resolution of asymptomatic hydronephrosis and hydroureter of pregnancy. The excretory urogram 17 days after delivery in Case 2 was considered to appear the same as in the usual case of asymptomatic hydronephrosis and hydroureter for that period postpartum.

Although beyond the scope of this report, Clark[3] described chronic symptoms of right ureteral obstruction appearing at the times of ovulation and menstruation. He considered that these symptoms resulted from incomplete involution of the right ovarian vein following pregnancy.

Summary

Three cases of the right ovarian vein syndrome are presented with a discussion of etiology, diagnosis and management. Awareness of this syndrome with closer follow-up of questionable cases may lead to greater recognition. The asymptomatic right hydronephrosis and hydroureter of pregnancy can be explained by the dilatation of the normal right ovarian vein. The symptomatic right hydronephrosis, hydroureter, and pyelonephritis of pregnancy may be attributed to dilatation of an aberrant right ovarian vein. Both result in differing degrees of ureteral obstruction and require specific therapeutic recognition.

REFERENCES

1. Arey, L. B. Developmental Anatomy, 7th ed. W. B. Saunders, Philadelphia, 1966, p. 368.
2. Bellina, J. H., Doughery, D. M. and Mikal, A. Transmyometrial Pelvic Venography. Obstet Gynec 34:194, 1969.
3. Clark, J. C. The Right Ovarian Vein Syndrome. In Clinical Urography, by J. L. Emmett. W. B. Saunders, Philadelphia, 1964, p. 1227.
4. Derrick, E. C. Jr., Rosenblum, R. R. and Lynch, K. M. Jr. Pathological Association of Right Ureter and Right Ovarian Vein. J Urol 97:633, 1967.
5. Derrick, F. C. and others. Incidence of Right Ovarian Vein Syndrome in Pregnant Females. Obstet Gynec 35:37, 1970.
6. Eastman, N. and Hellman, L. Williams. Obstetrics, 13th ed. Appleton, New York, 1966.
7. Fainstat, T. Ureteral Dilatation In Pregnancy; a review. Obstet Gynec Survey 18:845, 1963.
8. Gray, H. and Goss, C. M. Anatomy of the Human Body, 28th ed. Lea and Febiger, Philadelphia, 1966.
9. Hodgkinson, C. P. Physiology of the Ovarian Veins in Pregnancy. Obstet Gynec 1:26, 1953.
10. Hundley, J. M. and others. Some Physiological and Pathological Observations of the Urinary Tract During Pregnancy. Surg Obstet Gynec 66:360, 1938.
11. Hundley, J. M. Jr. and Diehl, W. K. The Influence of Gynecologic Disorders on the Urinary System. JAMA 127:572, 1945.
12. Pereira, R. M. Diagnosis of the Right Ovarian Vein Syndrome. Amer J Obstet Gynec 103:888, 1969.

(*Continued from page 39*)

litter in a manner indicating that it is heavy. Closer examination reveals a litter waiting to be loaded directly behind the "direction corpsman" on port side in left one-fourth of photograph. This photograph is definitely one of evacuation from ship to helicopter.

I also submit that both hospital ships were more than maximally expeditious in handling casualties. The fact is a better job could not and has never been done in all phases of casualty handling and entire patient care.

HMC J. W. Stacy, USN
Naval Hospital Corps School
San Diego, California 92134

Since the "Letters to the Editor" Column first appeared in the March 1970 issue, there has been little sustained response from our readers. The vast silent majority have remained mute. A potential for open forum discussions and informal communication has not been realized.

We applaud the above correspondents. They had worthwhile comments to make, and took the time to write. What a fine publication could result if there were more readers willing to drop us a line.

Major Cedola's letter was especially welcome. The cited rapport between Army and Navy during the combat situation warrants special recognition. U.S. Navy Medicine has had frequent occasion to hear favorable comment concerning DUSTOFF, further confirming the mutual regard referred to by the Major.

DENTAL OFFICER CERTIFIED BY AMERICAN BOARD OF ORAL PATHOLOGY

CAPT Seymour Hoffman, DC, USN, has been certified by the American Board of Oral Pathology. Captain Hoffman is presently assigned to the Armed Forces Institute of Pathology, Walter Reed Army Medical Center, Washington, D.C.

REVISED LINEAL LISTINGS OF MC OFFICERS

Certain inversions may result from modifications of the DOD Medical Officer Promotion Directive 1320.7 of 7 Aug. 1970. The principal criteria and credits under the new directive have been summarized below.

Promotion and entry grade credit for medical officers—the sum of four (4) years plus all active duty as a medical officer (including Public Health Commissioned Corps service) plus the following applicable periods of time.

1. Credit up to 3 years for unusual qualifications as determined by the Secretary or his designee including—but not limited to—possession of a degree in dentistry or a doctorate or comparable degree in a health discipline, not earned on active duty.

2. Active duty (other than as a medical or osteopathic student) as a commissioned officer in the Army, Navy, Marine Corps, Air Force or Coast Guard, other than as a Medical Corps officer—½ year for each year of such active duty, but not to exceed 3 years of credit.

3. Internship (successful completion—while not on active duty)—1 year.

4. Successful completions (while not on active duty) of one or more years of residency or similar training approved by AMA or AOA—1 year credit for each such year.

5. Certification by one or more specialty boards for officers serving in the grade of Commander—1 year.

6. Years subsequent to graduation from medical or osteopathic school not otherwise credited—¾ of a year for each such year. (This, in effect, restores the previous Navy 25% penalty for such professional time not in training or on active duty. This time was not penalized in the original DOD Directive and hence caused some inversions.)

The former requirement for one year of active duty as a medical officer before credit could be granted for service as a line or other officer in the next lower grade has been eliminated. The appointment or flow points to 0–4, 0–5, and 0–6 grades are the same, namely 8, 13, and 20 years counting 4 years of medical school and other credits as in paragraphs 1 through 6. (Again the, in effect, one year extra for new appointees with formerly 9, 14, and 21 years credit for appointment requirement [or promotion flow] points has been eliminated.)

The secondary zone now includes two years below the zone vice one year before. The number to be selected below the zone is up to 10% of those concurrently selected in the primary zone. These numbers do not count against the primary zone numbers but are in addition thereto. (This is a change.)

Some former line officers have been considerably out of line chronologically because credit had not been authorized previously for commissioned service other than as a medical officer. Likewise, board certification credit for promotion to Captain (0–6) grade will act to make such officers eligible for consideration at an earlier date than would otherwise have been the case. The combination of such additional credits acted to increase the number eligible for selection for promotion and acted to move some individuals from former positions below the primary or secondary zones into these zones. Individuals in the new secondary zone (or below) were not passed

over if individuals previously junior to them became eligible and were selected in the new criteria "primary zone" or below them in the new secondary zone. Only those in the new primary zone who were not selected were actually passed over.—Code 3, BuMed.

MEDICAL SCHOLARSHIPS

The initial group of students for the new Medical and Osteopathic Student Scholarship Plan have reported and all are now on active duty at their respective schools, as indicated below:

First Year Level

Name	*School*
Artnak, Edward J., Jr.	Emory
Baez, Stephen A.	Jefferson
Bayne, Cary G.	Virginia Medical College
Benjamin, Stanley B.	Pittsburgh
Bergin, Francis T., Jr.	Colorado
Blair, Timothy P.	Virginia
Coullahan, James D., Jr.	Vanderbilt
Crowley, Michael L.	Vanderbilt
Daggett, Robert B.	Illinois
Dean, Norman A.	Philadelphia, Osteopathic
Flandry, Robert E., Jr.	Tulane
Florey, James B.	Tulane
Flynn, Thomas J.	Case Western Reserve
Garrigues, Ned W.	Kansas
Gibb, Randall B.	Utah
Goyer, Peter F., Jr.	Johns Hopkins
Harrison, Robert W.	Temple
Hartshorn, Thomas E.	West Virginia
Hedges, John C.	California, Los Angeles
Higgins, Michael J.	Tulane
Hobbs, LaFloyd H., Jr.	North Carolina
Hoffman, Harry P.	Hahnemann
Howard, John J., Jr.	Loyola (Stritch)
Hunley, Richard Lee	Virginia
Jackson, Frederick L.	Kirksville, Osteopathic
Jacob, Rudolph D., III	Tulane
Knapp, Foster A.	Northwestern
La Rocque, James C.	Illinois
La Vallo, Patrick J.	Virginia Medical College
Leker, James G.	Mississippi
Looney, Glen M.	California, San Francisco
Marshall, Dallas P.	Texas, Galveston
McCance, David M.	Kirksville, Osteopathic
Navins, John P.	Minnesota
Ober, Vincent H.	Virginia Medical College
Page, William R.	Miami
Parker, Edward W.	Utah
Petway, Joseph K.	Howard
Snyder, David A.	Southern California
St. John, Thomas A.	Jefferson
Sweeney, Brian F.	Johns Hopkins
Sweet, John Paul	Pittsburgh

Tate, Emmett Lee	Louisville
Ulshafer, John F.	Maryland
Warren, Sanford E.	Virginia Medical College
Warren, Sharon D.	Arkansas
Wilder, Thomas L.	Texas, San Antonio
Williams, Norman M., Jr.	Hawaii
Worsham, George F., Jr.	South Carolina
Yeast, John D.	Missouri

Second Year Level

Alexander, Arvin H.	Northwestern
Beck, Bruce D.	Johns Hopkins
Brotherton, William D., III	Emory
Broughton, Warren L.	George Washington
Chesson, Ralph R., Jr.	Virginia Medical College
Everhart, Charles W.	Hahnemann
Felter, Robert A.	Georgetown
Grunert, George M.	Baylor
Hamrick, John D.	Virginia Medical College
Hardy, William L.	Miami
Harman, Richard L.	Miami
Harrell, Donald P.	Texas, San Antonio
Herndon, William A.	Florida
Hutton, Patrick M.	New York Medical
Kaires, Pamela A.	George Washington
Koskella, Kenneth Ray	Washington, St. Louis
Marzluff, Joseph M.	South Carolina
Mitas, John A., II	Georgia
Nelson, Robert C., Jr.	Colorado
Neumann, Leonard P., Jr.	Louisiana State
Parsons, Ward C.	Louisiana State
Roden, Danita A.	Texas, San Antonio
Shackford, Steven R.	St. Louis University
Tarquinio, Thom A.	Ohio State
Williams, David L.	Virginia

Third Year Level

Ashe, Walter D., Jr.	Tennessee
Brasted, Edward D.	Iowa
Carlstrom, Thomas A.	Iowa
Clark, William B., III	South Carolina
Curtis, Walter R. S., Jr.	Virginia
Forth, David S.	Duke
Freeman, Roger A., Jr.	Kentucky
Gorrell, Alan L.	Kentucky
Griffiths, Richard C.	George Washington
Joern, Albert T.	Oklahoma
Kammeyer, Steven E.	Utah
Kwentus, Joseph A.	St. Louis University
Laflin, Michael J.	St. Louis University
Lloyd, Bruce K.	Cornell

McReynolds, John W.	Oklahoma
Miller, Richard C.	Pennsylvania
Nielson, Peter E.	Cornell
O'Bryan, Robert K.	Baylor
Pittard, Joel C.	Georgia
Safer, Michael L.	Florida
Seeds, John W.	Virginia
Spencer, Jerry D.	Kansas
Swanson, George C.	Florida
Wagner, William J., Jr.	Texas, Galveston
Zachary, David R.	Creighton

It is interesting to note:

(a) There were 100 selections;

(b) There were 641 completed applications;

(c) Selections included 11 line officers, one MSC officer, one hospital corpsman, one PFC in the Marine Corps, three ladies, 35 military juniors, 6 graduates of the Naval Academy and 42 students who already held appointments in the basic (Ensign 1915) medical student program.—Code 31, BuMed.

SELECTION OF MEDICAL RESIDENTS ASSIST BY SAC*

During the periods Oct. 22–23, 26–27, and 29–30, 1970, approximately 90 chiefs of graduate training programs met in BUMED to help the Professional Advisory Board select residents for the various programs of Fiscal Year 1971. The meeting provided a forum for free exchange of ideas and many management misunderstandings were cleared.

Three separate meetings were conducted in groups of 30. These groups were broadly divided into surgical and medical specialties. In addition to assisting the Professional Advisory Board in the selection of residents, these groups also explored in depth the many problems germane to each of their specialties. Each group met in a two-day session, the first day of which was exploratory in nature. The exploratory portion of the program was held in plenary sessions with presentation by various members of BUMED on such subjects as Current Training Plans, Career Planning, The Role of Research in the Graduate Training Hospital, Planning and Logistics, Understanding the Budget, and Civilian Trends in Medical Education. Some of the more pressing problems which were discussed in detail included the leave situation for residents, the status of the straight internship, the first year of residency training, moonlighting, fiscal responsibility, and retention of career medical officers. Although the two-day session provided insufficient time to resolve many of the problems presented, several solutions which resulted merit comment here.

During the second day of the conference, the Specialty Advisory Committee (SAC) was divided into smaller specialty groups which met in separate conference rooms where they reviewed in detail the qualification of each applicant for residency and/or fellowship training. These panels reviewed the jackets of 487 applicants. Of those who requested inservice training, the group recommended 177 applicants for the 183 positions to be filled. 105 of the remaining applicants were designated as alternates. All programs were filled except for Anesthesiology, General Practice, Pathology, and Psychiatry. An additional Professional Advisory Board meeting is planned for January of 1971 to select late applicants and alternates for any vacancies which may exist at that time. The SAC Group also considered applications for outservice training, and recommended that nine positions be filled in 1971. Two individuals were preselected to begin their training in the summer of 1972.

Following residency selections, the group then turned their attention to the areas previously mentioned, and addressed themselves to specific problems germane to each of their specialty groups. At the end of the two-day session the chairman of each specialty group prepared for the Surgeon General recommendations concerning general or specific problems discussed by the group. It was generally considered that residents should be granted 30 days' leave during each Fiscal Year provided that this does not conflict with the policy of the specialty Board concerned, and provided that such leave would not

* SAC—Specialty Advisory Committee

interfere with the training of the individual in the opinion of the chief of service. The final approval or disapproval of this leave is the prerogative of the commanding officer. The group recommended that a BUMED NOTICE on this subject be published. (Such publication will be forthcoming in the next few weeks.) It was concluded that for the present at least, the current BUMED policy of requiring that straight interns begin their residency training at the first-year level was in the best interest of the Navy. The need for flexibility was recognized, however, so that this policy can be changed to conform with the programs proposed by the various civilian agencies in the future. Collectively, the majority of members felt that BUMED should not expand on its present policy of limiting the straight internship to Internal Medicine and General Surgery. The groups were unanimous in agreement that moonlighting was to be discouraged if not prohibited, however, such decisions should remain the prerogative of each commanding officer. All groups recommended that this type of annual conference be continued, and if at all possible, expanded to a four or five-day session. A coordinated convention of the various groups into one conference center was suggested.

The Surgeon General was encouraged by the enthusiasm with which each participant pursued the problems placed before him. The evident dedication, industry and loyalty of these medical officers gives every indication that the future of the Navy Medical Corps and its medical education programs is indeed bright.—CAPT E. J. Rupnik, MC, USN; Head, Training Branch of Professional Division, BUMED.

FORMULARY NOTES

As a result of the National Academy of Sciences/National Research Council (NAS/NRC) Study on Drug Effectiveness, the Food and Drug Administration (FDA) has classified an extensive listing of drug products as ineffective. While the FDA has not as yet withdrawn the applicable New Drug Applications (NDA's), such action is probable in the near future. A copy of the listing will be distributed to appropriate Medical Department officers by a forthcoming BUMED Notice in the 6710 series.

Three other products declared to be ineffective by FDA are reportedly no longer marketed. They may, however, still be offered by local retailers. Naval activities should not procure any of the following, and should dispose of quantities on hand:

Sulfadexan Liquid	Abbott Laboratories
Lokol Drops	Frank W. Horner, Ltd.
Marfedrin (Mardin) Solution	Travenol Laboratories, Inc.

NDA's have been withdrawn by FDA on all products which contain sulfathiazole. The NAS/NRC Study reports that the risk/benefit ratio is unacceptable, since other sulfonamides are equally effective, and less dangerous. A BUMED Notice in the 6710 series will list product identification for designated mailing list of Medical Department officers.—Code 4A, BUMED.

HOSPITAL FOOD SERVICE NOTES

Effective 18 November 1970, BuMed has standardized on a therapeutic diet manual, the Air Force Manual 160–8 APPLIED CLINICAL NUTRITION. (Additional copies may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 at a cost of $2.00 per copy.) This manual is recommended for use in all naval hospital food service programs. In the past, each naval hospital developed its own diet manual. Each manual was different in scope and consistency, and diet therapy between naval hospitals was practically impossible to achieve. This standardization will provide conformity of diets within naval hospital food service programs so medical/dental officers and other users can be assured of diet standardization as they transfer from hospital to hospital, and will insure that patients undergoing multi-service transit procedures will receive consistent and proper diets during entire transit period.

CDR E. J. Irvin, MSC, USN, BUMED, Head, Food Service Branch is Chairman of the Interagency Committee on Food Items for Federal Hospitals. It is anticipated that this committee will, in the near future, develop a standardized diet manual for use in Federal Hospitals similar to the Federal Hospital Subsistence Guide being used by Federal Hospitals in food procurement functions.

Efforts initiated to provide naval hospital food service directorates with associate or other reduced-fee membership in the National Restaurant Association have resulted in the Association offering minimum fee ($50/year) membership for each naval hospital having in-house food service capabilities.

Benefits that will thereby accrue to our naval hospital food service departments are: membership in a national organization dedicated to improved food services through assistance in management and em-

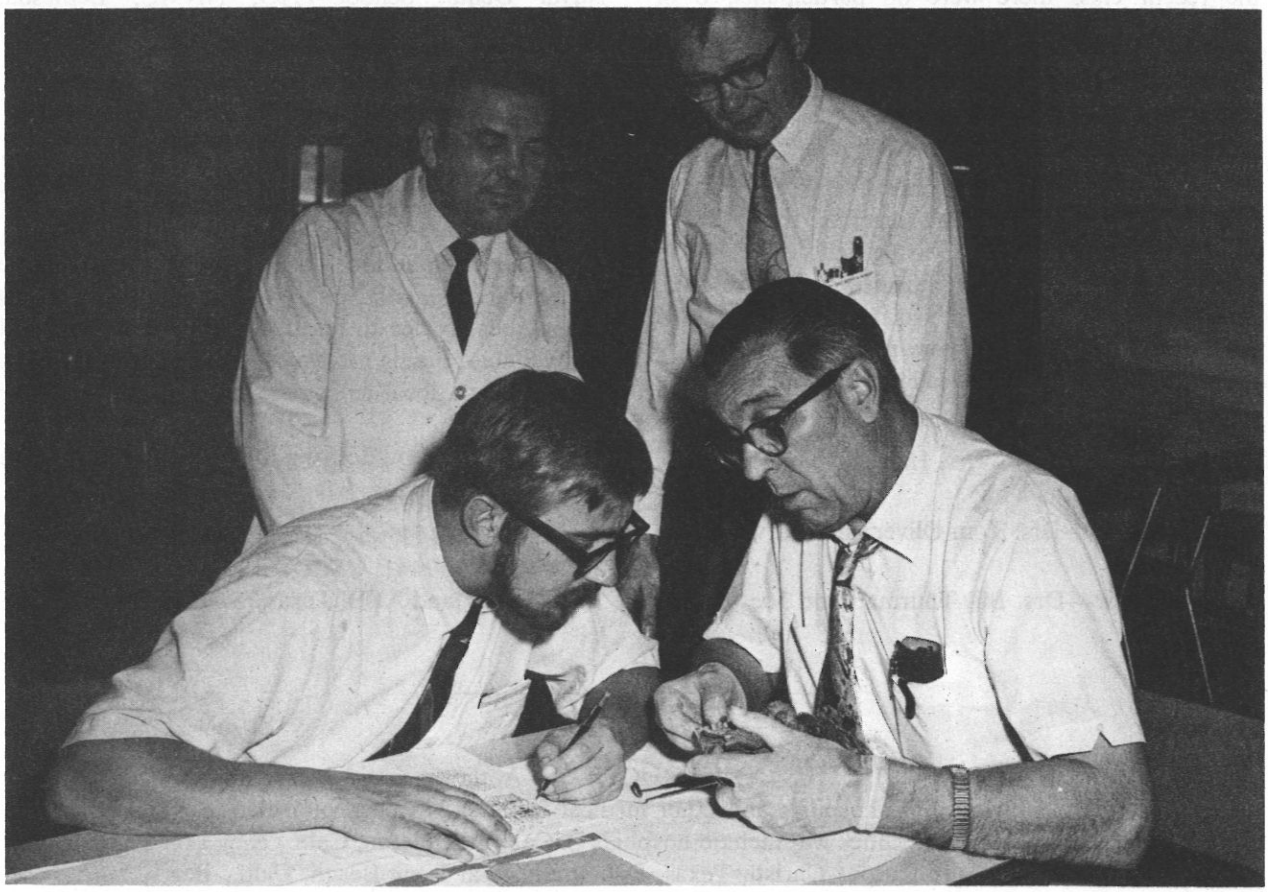
ployee training, food promotion ideas, new developments in equipment and operating methods, publications, increased worker productivity, better safety, sanitation and public relations. The Association maintains a Speakers' Bureau available to members in coordinating training workshops, seminars, etc. A film library is also maintained for training purposes; a library of reference publications covering every element of the food service industry is also maintained.—Code 443, BUMED.

FORENSIC DENTISTRY COURSE

In laboratory classes held recently at the Naval Dental School, National Naval Medical Center, Bethesda, Md., participants attending a forensic dentistry course were instructed in methods of making body identification through the use of dental records.

The classes conducted by CAPT George H. Green, DC, USN, Oral Pathology Department, provided an opportunity to establish identification of aircraft accident victims based on dental evidence alone. The laboratory problem was originated and developed by CAPT Green, who is co-founder of the forensic dentistry course and the only faculty member to serve continuously since the founding of the course in 1962.

The objective of the course is to develop a critically needed nucleus of dentists trained in the principles of identification and dental jurisprudence. Since dental evidence is often the only means of establishing a positive identification of the ever-increasing number of single and mass casualty victims, trained dentists can often determine the approximate age, sex, race, occupation, various habits, and part of the



During a forensic dentistry course at the Naval Dental School, CAPT George H. Green, DC, USN, Oral Pathologist and Officer-in-charge of the course (standing on the left) and Instructor Dr. Curtis A. Mertz, consultant in forensic dentistry to the Ohio State Police Department (standing on the right), observe the charting of teeth and examination of human remains by participants LCDR John C. Dittmer, MC, USNR, Berkeley, Calif., and Mr. Joseph W. Martin, Jr., Police Station, Criminal Bureau, Billerica, Mass.

country in which the individual spent most of his life from examination of portions of the dental arch and the teeth or jaws. It is also possible to positively identify the suspect in many types of criminal cases on the basis of bite marks on the victims. In the past year, CAPT Green's testimony was the decisive factor in the identification of bite marks in cases of assault and murder—the first time in the United States that such evidence was admitted in court in a murder trial.

The forensic dentistry course is conducted annually through the Armed Forces Institute of Pathology's continuing education program. The only course of its kind held in the United States, it is one of the few which exist in the world. It has gained wide attention, and draws enrollees from dentists, physicians, legal and law enforcement officers of the armed forces, Public Health Service, Veterans Administration, and various civilian organizations. In the recent class there were 88 participants, 6 of whom were foreign nationals.

CAPT Green was recently awarded the Army Commendation Medal for services at the Armed Forces Institute of Pathology, from Dec. 1965 to Sept. 1969, as Chief, Environmental Oral Pathology Branch, and Assistant Chief of Dental and Oral Pathology Division. The third Navy recipient of the award for services at the AFIP, CAPT Green was cited for helping to originate the concept of a Dental and Oral Pathology Case of the Month Program in which cases of unusual interest are sent out to oral pathology teaching centers throughout the world. This program proved to be so effective and popular that the Armed Forces Institute of Pathology adopted the program and now distributes a Pathology Case of the Month.

One of the first oral pathologists in the country to become interested in forensic dentistry and while stationed at the AFIP in 1962, CAPT Green was a co-founder of the Forensic Dentistry course. At present he is assigned to the Oral Pathology Dept., Naval Dental School.–PAO, NNMC, Bethesda, Md. Official U.S. Navy Photo by R. M. Oswald.

PEDIATRIC SEMINAR

The Seventh Annual Uniformed Services Pediatric Seminar will be a four-day meeting from 15–18 March 1971. The meeting will be held in the Hilton Palacio Del Rio Hotel in downtown San Antonio, Texas. The Air Force is sponsoring the program this year and in addition to papers presented by military pediatricians the program will include the following guest speakers:

Infectious Diseases—Drs. Heinz Eichenwald, Paul Wehole and Martha Yow

Pennatology—Drs. Tom Oliver and Marvin Cornblath

Hematology—Drs. Bill Thurman and Joe Simone

Nephrology—Drs. Bill Daeschner and Bob Vernier.

Further information will be provided later relative to hotel accommodations. For those preferring BOQ rooms, bus service to and from Lackland AFB will be available. Funds for Naval Medical Officers must come out of local hospital funds so put in your requests early.

For those of you desiring to submit papers, please forward abstracts to:

Colonel Howard H. Johnson
Box 369441, CMR #8
Lackland AFB, Texas 78236

MEDICAL FACILITIES CONSTRUCTION—Authorization for new construction of replacement hospitals and other medical facilities has been budgeted in FY 1971. The new facilities will include hospitals at Camp Pendleton, Calif., New London, Conn. and Corpus Christi, Texas. Dental clinics at Long Beach, Calif., Pearl Harbor and Camp Pendleton, and a Dispensary at Camp Pendleton are the other new projects, the total costs of which will exceed $55 million.

GARY P. WRATTEN SURGICAL SYMPOSIUM

The 1971 Gary P. Wratten Surgical Symposium will be held at the Walter Reed Army Hospital on Monday, Tuesday, and Wednesday, 29, 30 and 31 March 1971.

The program for this symposium will include recent advances in the fields of general surgery and the surgical specialties, new advances in clinical research, and new procedures and techniques. Civilian surgeons of national prominence are included on the program.

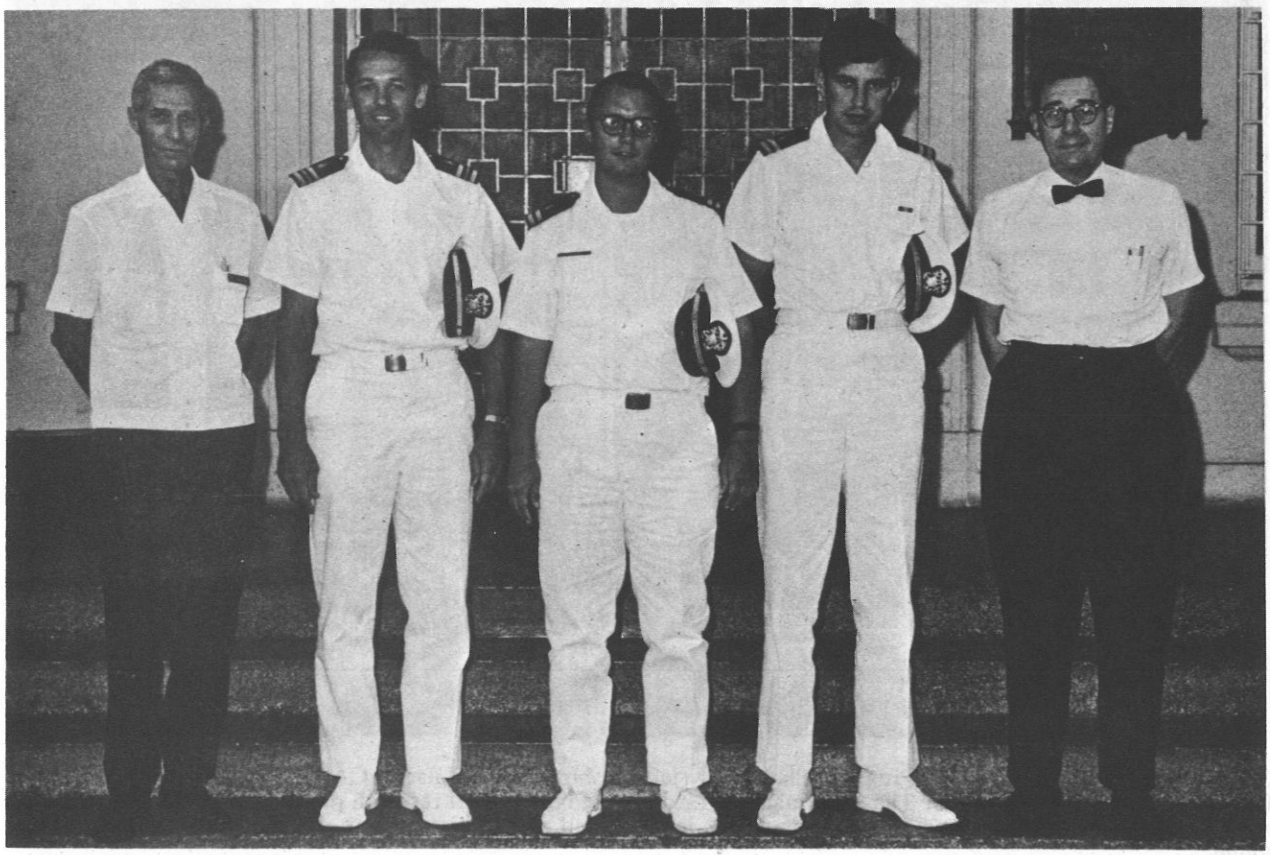
The Symposium is open to surgeons of the Army, Air Force, Navy, Veterans Administration, Public Health Service and also civilians, particularly from the Reserve Corps and National Guard.

Naval Medical Corps Officers desiring to attend this symposium should apply to the Bureau of Medicine and Surgery (Attn: Code 316) for quota assignment.

COMPLETE COURSE AT GORGAS

Three U.S. Navy Medical Officers recently completed a six-week course in Tropical and International Medicine which is jointly sponsored by the Gorgas Memorial Laboratory, Panama, R.P. and the Navy Bureau of Medicine and Surgery. Physicians are selected from Naval Hospitals in the U.S. where they are undergoing residency training in various specialties. This is the fourth group to participate in the program which commenced in January 1970.

Pictured from left to right are: Dr. Carl M. Johnson, Chief of Pathology and Clinical Services, Gorgas Memorial Laboratory; LCDR William J. Godfrey, MC, USNR, Naval Hospital, Portsmouth, Va.; LT John C. Pollard, MC, USNR, Naval Hospital, San Diego, Calif.; LT Clive R. Charles, MC, USNR, Naval Hospital, Philadelphia, Pa.; Dr. Martin D. Young, Director, Gorgas Memorial Laboratory.–PAO, Quarry Heights, Canal Zone and PAO, 15th N.D.



The Secretary of the Navy has approved the establishment of U.S. Naval Hospital, Roosevelt Roads, Puerto Rico, with the following mission statement:

"To provide general clinical and hospitalization services for active duty Navy and Marine Corps personnel, active duty members of the other armed services, dependents of active duty personnel, and other authorized persons as outlined in current directives. To cooperate with military and civil authorities in matters pertaining to health, sanitation, local disasters and other emergencies."

ACOG MEETING

The American College of Obstetrics and Gynecology held its annual meeting in Las Vegas, Nev., 19–23 October 1970. Armed Forces medical officers constitute a District under the aegis of the College. The Air Force hosted this year's meeting. Next year, the Navy will act as host and no less than 800 Armed Forces members are expected to attend. District chairman is CAPT James P. Semmens, MC, USN of the Naval Hospital at Long Beach, Calif.

The 19th Annual Armed Forces Seminar on OB-GYN was held in conjunction with the 9th Annual Armed Forces District Meeting, ACOG. The Armed Forces OB-GYN Seminar actually predates the formation of ACOG by almost one year.—CAPT R. K. Barton, MC, USN, Director Professional Division, BUMED.

COL Joseph Wesp, MC, USAF, Program Chairman, (left) is shown congratulating CAPT Richard L. Bernstine, MC, USN, who received two awards: The Chairman's Award for the best clinical research paper prepared on obstetrics in a teaching hospital; and 1st prize in scientific exhibits in sponsored class, "Fetal Heart Studies with Doppler Ultrasound".

LTJG Louis Weinstein, USNR, Bowman Grey School of Medicine, Winston-Salem, N.C. is greeted by RADM H. D. Warden, MC, USN, (center), CO NavHosp San Diego, Calif., as CAPT W. A. Johnson, MC, USN (Director of Naval Reserve Division, BUMED) looks on. LTJG Weinstein, a member of the 1915 program, was selected by the Navy for attendance at the district meeting under the auspices of a student travel fund.

OFFICIAL INSTRUCTIONS, NOTICES AND CHANGES

BUMED NOTICE 1510 of 20 Nov 1970

Subj: Group X Hospital Corpsman Training

Announces the consolidation of the present Advanced General Service Technician (Class "B") and Medical Administrative Technician (Class "C") course into one course of instruction, Medical Services Technic (Class "C") effective 1 January 1971. This new course will insure career enhancement and quality medical service by hospital corpsmen serving on sea duty independent of direct Medical Officer supervision. Additionally, a ten day refresher training program has been established to update and familiarize personnel with the duties and responsibilities of a hospital corpsman serving on independent duty.

MANUAL OF THE MEDICAL DEPARTMENT

Change 60, 15 October 1970

a. Deletes article 3–34, Vasectomy, as SECNAVINST 6300.2 contains current policy on family planning services.

b. Changes 6–98(1) on availability of dental treatment for retired members of the uniformed services and their dependents and for eligible survivors of deceased members.

c. Revises 6–104, Inscription on Dentures for Identification, for inscribing the members Social Security Account Number on stainless steel metal for insertion in the denture base.

d. In 6–146 updates title of *U.S. Navy Medicine* (vice U.S. Navy Medical News Letter), and in 6–

147 corrects the number of the SECNAVINST referenced for disposition of dental records.

e. Revises 15–31(3)(n) and (5) concerning Antarctica duty.

f. Changes 18–19(2)(a) which authorizes a member to read or be furnished a copy of his medical board report (see BUMEDNOTE 6100 of 9 Sept 70).

MARINE CORPS HEADQUARTERS BULLETIN 5400 of 10 Nov 1970

Subj: Change in Title for Certain Headquarters Marine Corps Staff Officers

Announces the change of titles of the Staff Medical Officer, Staff Dental Officer, and the Staff Chaplain to read as follows:

The Medical Officer, U.S. Marine Corps
The Dental Officer, U.S Marine Corps
The Chaplain, U.S. Marine Corps

The title changes are intended as a means by which the incumbents of these billets may enjoy a more prestigious position commensurate with their duties and responsibilities at Headquarters Marine Corps level and in recognition of their relationships with the considerable number of naval personnel performing duties with the Marine Corps.

In Memoriam

RADM Paul Tracy Crosby, MC, USN (Ret) died 6 November 1970 at his home in DeWitt, New York. He was 80 years of age. Admiral Crosby was a native of Seneca Falls, N.Y. and graduated in 1915 from Syracuse University Medical School. He entered the Navy in 1917 serving first with the Marines during World War I. Since the late 1920's Admiral Crosby had specialized in psychiatry. He retired from the Navy in 1947. He is survived by his wife and a son, CDR John Crosby, USN, (Ret).

Dr. William C. Manion, 54 years, died 5 November 1970 at his Kensington, Md. home as a result of heart disease. A native of Bethel, Conn., he graduated from Catholic University in 1939 and received his medical degree from Georgetown University in 1943. He served with the U.S. Marine Corps as a medical officer in the Pacific theater during World War II. Dr. Manion was an authority on cardiovascular diseases and was the recipient of numerous medical awards. Since 1952 Dr. Manion had been on the staff of the Armed Forces Institute of Pathology where he developed a cardiovascular pathology department. He is survived by his wife and four sons.

RADM John Quincy Owsley, MC, USN (Ret) died of a heart attack on 10 October 1970 in La Jolla, Calif. Born in Nashville, Tenn. on 20 November 1899, his career as a medical officer began in 1924 after graduation from the Vanderbilt University Medical School in Nashville. During the period April 1942 to June 1943, RADM Owsley was Senior Medical Officer of the USS Enterprise and participated in the major campaigns in the South Pacific War area including Guadalcanal, Midway, Santa Cruz, and Stewart Islands. The ENTERPRISE was awarded the Presidential Unit Citation for repeated action against enemy Japanese forces and Dr. Owsley was commended for his especially meritorious service while aboard the ENTERPRISE. On 1 June 1953 he reported to the Bureau of Medicine and Surgery to serve as Assistant Chief for Personnel and Professional Operations. Admiral Owsley's name was transferred to the Retired List on 1 May 1959. He is survived by his wife and one son.

CAPT Marion Thomas Rosser, MC, USN (Ret) died 1 October 1970 at the Tucson Medical Center, Tucson, Arizona. He was born 19 October 1901 in Accomac County, Va., and received his medical degree from the University of Virginia. Prior to being commissioned a LCDR, MC, USNR in 1938, he practiced medicine in Washington, D.C. and Virginia. In 1939 Dr. Rosser reported for active duty and in 1941 he was designated a naval flight surgeon. He transferred to USN in 1947 and served on active duty until his retirement in May 1960. He is survived by his wife and two children.

CAPT Edward L. Thomas, MC, USNR (Ret) died of heart failure at the Naval Hospital, Philadelphia, on 10 October 1970. He was born 8 April 1900 in Philadelphia, receiving his premedical education at the University of Pennsylvania and his M.D. degree from the Jefferson Medical College in 1926. He was appointed a LCDR, MC, in the U.S. Navy on 10 April 1942 and reported to the Bureau of Medicine and Surgery for active duty on 11 May 1942. He retired in May 1962.

CORRESPONDENCE AND CONTRIBUTIONS from the field are welcomed and will be published as space permits, subject to editing and possible abridgment. All material should be submitted to the Editor, U.S. Navy Medicine, Code 18, Bureau of Medicine and Surgery, Washington, D.C. 20390.

NOTICES should be received not later than the third day of the month preceding the month of publication.

PROFESSIONAL PAPERS AND ARTICLES should be typewritten on one side of the paper, double spaced, with liberal margins. Original and one carbon copy are required. Generic names of drugs are preferred. If the author's present affiliation differs from that under which the reported work was done, both should be given. Unless otherwise indicated, it will be assumed that the article presented has not been previously printed or delivered elsewhere. Papers which have been delivered or printed elsewhere, covered by copyright, cannot be reprinted in Navy Medicine without the written permission of the author(s) and copyright holder. It is the responsibility of the author(s) to inform U.S. Navy Medicine when the material submitted has been previously used or copyrighted. Navy Medicine will be happy to request permission to reprint from the copyright holder when this is necessary.

ILLUSTRATIONS are acceptable when they substantially contribute to the understanding of the basic material. Only distinct, glossy, black and white PHOTOGRAPHS which are functional can be printed. Prints should not be mounted, stapled, clipped or otherwise deformed and can be marked lightly on the back with the figure number. Legends should be typed consecutively on a separate paper with the indicated figures; credits for the photography may also be included. Identities of patients should be masked. DRAWINGS, TABLES AND GRAPHS should be minimal in number and properly labeled. They should be neatly done in heavy black ink on white paper, one to a page.

SUGGESTIONS are invited concerning U.S. Navy Medicine, its content and form.

U.S. NAVAL PUBLICATIONS and FORMS CENTER
ATTN: CODE 306
5801 Tabor Avenue
Philadelphia, Pa. 19120
Official Business

POSTAGE AND FEES PAID
NAVY DEPARTMENT

U.S. NAVY MEDICINE

☆ U. S. GOVERNMENT PRINTING OFFICE : 1971 434-360/5